



75·23

*Boston Med*

**BOSTON**  
**MEDICAL LIBRARY**  
**8 THE FENWAY**



Digitized by the Internet Archive  
in 2011 with funding from  
Open Knowledge Commons and Harvard Medical School

*Recently published, by the same Author.*

---

COUP D'ŒIL sur les HOPITAUX de LONDRES  
et sur L'ÉTAT actuel de la MÉDECINE, et de la CHI-  
RURGIE en ANGLETERRE.

J. B. BAILLIÈRE, PARIS, AND REGENT STREET.

---

Also, in 8vo. price 8s.,

OBSERVATIONS on the principal MEDICAL IN-  
STITUTIONS and PRACTICE of FRANCE, ITALY,  
and GERMANY, with Notices of the Universities, and  
Cases from Hospital Practice; to which is added, an Ap-  
pendix on Animal Magnetism and Homœopathy.

J. CHURCHILL, PRINCES STREET, SOHO.

The Appendix may be procured separately, price 2s.

“Combining so much of the *utile* with the *dulce*, so many facts, with so concise a manner of announcing them.”

“We cordially recommend it to the profession.” — *London Medical and Surgical Journal*.

“We are much deceived if it fail to interest most of those who look through it.”

“The author visited almost all the principal seats of learning and medical science in France, Italy, and Germany; and the account which he gives of them is so sketchy and animated, that the chief fault to be found with it, perhaps, is that it does not present us with details more copious.” — *Medical Gazette*.

“The contents of this volume are justly described in the Preface as presenting an impartial and not inaccurate sketch of the actual state of medical practice in France and Italy, with some notes on German institutions less copious, but calculated to convey some idea of the state of practice.” — *Lancet*.

“Un résumé statistique fort intéressant des principaux établissements médicaux du Continent.” — *Gazette Médicale de Paris*.

“Mr. Lee’s account of the state of medical practice in France is succinct and interesting.” — *British and Foreign Medical Review*.

“L’ouvrage de M. Lee mérite une attention particulière son

livre peut être lu avec un intérêt égal par les médecins du Continent et les médecins Anglais.”

“L’ouvrage de M. Lee est écrit avec plus d’indépendance et de justice qu’on n’en trouve ordinairement. Ses observations comparées sont presque toujours justes, et font autant d’honneur à son savoir qu’à son jugement.” — *Revue Medico-Chirurgicale Anglais*.

“This sensible and judicious pamphlet.” — *Monthly Review*.

“It is plain that a system of this sort (Homœopathy) will be hailed by quacks as a fertile source for the delusion of fools, and increase of their own plunder and profits; and Mr. Lee deserves commendation for having exposed, and it is hoped prevented, the progress of it in this country.” — *Times*.

“Mr. Lee has completely exposed and refuted these two most absurd doctrines, the offspring of ignorance and imposture.” — *Literary Gazette*.

---

In 8vo., price 5s.,

A TREATISE on some NERVOUS DISORDERS;  
being chiefly intended to illustrate those Varieties which  
simulate Structural Disease.

JOHN CHURCHILL, PRINCES STREET, SOHO.

“We are, therefore, grateful for any additional information that comes from such respectable authority as Mr. Lec, who, though he addresses himself more particularly to the junior members of the profession, may fairly claim the attention of old and experienced practitioners.” — *Medical and Physical Journal*, July, 1833.

“Mr. Lec’s work is of a practical nature, and worthy of attention, the author being a gentleman of observation who has carefully studied his profession in this and in other countries.” — *Medico-Chirurgical Review*, January, 1834.

---

In 12mo., price 5s.,

NOTES on ITALY and RHENISH GERMANY.

WHITTAKER AND CO., LONDON; LAING AND FORBES, EDINBURGH.

“Mr. Lee deserves the thanks of the community for the valuable information with which he has furnished them in his small unpretending volume, which contains professional notices of Nice, Pisa, Florence, Rome, and Naples; and of Baden, Wisbaden, Schwalbach, Ems, and Aix-la-Chapelle.” — *Edinburgh Advertiser*.

AN  
A C C O U N T  
OF  
THE MOST FREQUENTED  
W A T E R I N G P L A C E S  
ON THE CONTINENT,  
AND OF  
THE MEDICINAL APPLICATION OF THEIR  
MINERAL SPRINGS;  
WITH  
*Tables of Analysis,*  
AND AN APPENDIX ON ENGLISH MINERAL WATERS.

*C* BY  
EDWIN LEE, ESQ. M.R.C.S.  
AUTHOR OF "OBSERVATIONS ON CONTINENTAL MEDICAL  
INSTITUTIONS AND PRACTICE;"  
"TREATISE ON NERVOUS DISORDERS," ETC.

---

LONDON:  
PRINTED FOR  
LONGMAN, REES, ORME, BROWN, GREEN, AND LONGMAN,  
PATERNOSTER-ROW; AND  
GALIGNANI, RUE VIVIENNE, PARIS.  
1836.

Vol. 2. Part 1. No. 1.



22. 2. 61.

MTDEA  
151

LONDON :  
Printed by A. SPOTTISWOODE,  
New-Street-Square.



## P R E F A C E.

---

NOTWITHSTANDING the number of works on mineral waters which have emanated from the Continental press, there scarcely exists any recent publication which is at all of a general nature on the same subject in the English language; a circumstance which indicates that this important class of medicinal agents is held in much less consideration among us than it deserves. I leave to others more competent the task of remedying this deficiency in English medical literature, as the present work, in which several points connected with mineral waters are not touched upon, is intended to convey to the pro-

fession, and to such persons as feel interested in the matter, a concise account of the practical application of the principal Continental Mineral Springs, as well as of the local advantages and resources for recreation presented by the different watering places ; without, however, entering into details which may be found in the Guide Books, and which must have materially added to the size of the volume without increasing its utility.

Having visited and inquired into the properties of most of the mineral springs on the Continent to which my countrymen are in the habit of resorting, I have on several occasions remarked the uncertainty and indecision among invalids and their friends as to the mineral water to be selected, in consequence of their having been vaguely recommended by their professional attendants to try a course of some of the Continental waters ; and there

are few among the physicians resident at watering places who, on being consulted, would not consider the springs to which they are attached to be of superior efficacy to others, and applicable in some form or other to the majority of cases which fall under their notice. If, therefore, this work contribute to the diffusion of more precise information on the subject, and enable professional men and invalids to form a more correct opinion as to the choice of a proper kind of mineral water in individual cases, I shall feel happy in considering it as instrumental in the alleviation of suffering in some cases, and in obviating some of the inconveniences to which English persons resorting to Continental watering places have been subjected.

Several mineral springs of minor celebrity, or which are less likely to interest English travellers, have been noticed in a more cursory manner; and the account of

those places which I have not visited, as well as the tables of analysis, have been taken from the most approved authorities. Of these I may mention Dr. Osann's "Darstellung der bekannten Heilquellen Europas," as the work to which I am most indebted. Thinking it would render the book more generally useful, I have appended a brief notice of some English mineral springs, in order to compare them with some Continental ones; and as my knowledge of their composition was very limited, I have availed myself of the work of Sir C. Scudamore, and of Dr. Thompson's article on Mineral Waters in the *Cyclopædia of Practical Medicine*, to obtain the most correct information respecting them.

EDWIN LEE.

CHELTENHAM, *Sept.* 1836.

## CONTENTS.

---

General Observations on Mineral Waters	-	Page 1
Sulphurous Springs        -        -        -	-	49
Chalybeate Springs        -        -	-	79
Saline Thermal Springs        -        -	-	113
Saline Aperient Springs -        -        -	-	145
Alkaline Springs        -        -	-	164
Acidulous Springs        -        -        -	-	196
Appendix on English Mineral Springs	-        -	215



DEC 5 1888  
LIBRARY

### ERRATA.

- Page 16. line 6. from bottom, for " Bréges " read " Baréges."  
1. 2. from bottom, for " Toplitz " read " Teplitz."  
42. l. 9. for " Borchette " read " Borcette."  
49. l. 5. from bottom, for " by noise " read " by the noise."  
62. l. 12. for " a normal " read " anormal."  
119. l. 4. for " Pymont " read " Bourbonne-les-Bains."  
175. l. 10. insert a semicolon after " blood."  
194. l. 8. for " Friënbad " read " Frauenbad."  
211. l. 6. for " Wüzzer " read " Würzer."  
212. l. 8. from bottom, for " Mabrunnen " read " Maxbrunnen."

mitted down to the present time, and evidence of the high estimation in which they were held. By the Pagans they were considered to be direct gifts from the gods for the benefit of mankind ; and their operation on the human body has at all





AN ACCOUNT  
OF THE MOST FREQUENTED  
**WATERING PLACES**  
ON  
**THE CONTINENT.**

---

GENERAL CONSIDERATIONS ON MINERAL  
WATERS.

MINERAL waters have been employed for the removal and alleviation of disease from a very early period. The frequent allusion to them in ancient writings, the remains of magnificent structures found at several thermal springs, and the traditional accounts which have been transmitted down to the present time, afford evidence of the high estimation in which they were held. By the Pagans they were considered to be direct gifts from the gods for the benefit of mankind; and their operation on the human body has at all

times been ascribed by many to occult and mysterious properties somewhat approaching to the miraculous,—an idea which is still entertained by some individuals, notwithstanding the progress of science has demonstrated that their action is referrible to the ordinary principles of therapeutics; though it must be confessed that our knowledge of the mode of action of medicinal agents yet remains enveloped in great obscurity.

It would appear that in former times thermal waters were mostly used in the form of baths; this is the case with many on the Continent in the present day, though in England they are comparatively seldom used in this manner. In fact, it would be difficult to account for our neglect of the bath, both as a hygienic measure and as a remedy in disease. Notwithstanding the greater density of its atmosphere, and the number of its inhabitants, London possesses but few facilities for bathing compared with Continental cities, where baths are numerous, well arranged, and at a price which puts them within the reach of all. Is it surprising that in individuals who pass months together without taking a bath, the functions of the

skin should become impaired, — its circulation inactive, — the secretion obstructed and vitiated, frequently giving rise by its reabsorption to derangement of health, and to various diseases which the practitioner vainly seeks to remove by internal medicine, but which often disappear after bathing and a short residence at the sea side? The frequent ablutions and baths ordained by the Mahometan religion, is probably one cause of the exemption of Eastern nations from many complaints which are so prevalent and so intractable among us; and I have no doubt that many cases of chronic derangement of the digestive and urinary apparatus, of nervous disease, as well as of catarrh, bronchial irritation, and rheumatism, would be remedied by the use of baths alone, and that the tendency to these affections would be materially lessened in England, were people in health accustomed to regulate the functions of the skin by bathing more frequently than is generally the case.

Mineral springs are much more employed on the Continent, in the treatment both of acute and chronic disease, than in England, where their

use is almost entirely confined to the higher classes of society ; and even in cases where they are recommended, it is seldom that the water is allowed a fair trial ; for practitioners at English watering places, unlike their Continental confreres—who consider the springs where they reside to be a sovereign panacea for the majority of chronic ailments, and mostly prohibit the simultaneous employment of pharmaceutic remedies,—generally prescribe at the same time other medicines more or less active, and thus nullify the chances of a beneficial effect being produced by the water : hence one reason why many English invalids place no reliance on the efficacy of the mineral waters of their own country, flock to those of the Continent, and no doubt often derive as much benefit from the change of scene, mode of living, and absence of active pharmaceutical treatment, as from the operation of the springs themselves.

Not only are mineral springs which admit of exportation used by the public, and by medical men both in private and hospital practice, in large Continental towns, but artificial mineral waters

are manufactured and used to a great extent in the principal towns of France and Germany. At many of the watering places, especially in Germany, hospitals are established by the government for the reception of the sick poor to whose cases the water is considered adapted.\*

These circumstances show the great estimation in which mineral waters are held by foreigners. I am aware many persons entertain the opinion that the benefit is to be attributed to other causes; as the journey to the watering place, the mental relaxation and freedom from the cares of avocation, the inducements to take exercise in the open air, the more regular and abstemious mode of living, the influence of the imagination, &c. That many invalids would derive great advantage from mere change of air, scene, and mode of life, is unquestionable; and it is equally true that without these important auxiliaries no beneficial effect would be produced in many instances; yet there is no doubt that the benefit obtained in the majority of cases is chiefly to be attributed to the

\* This is also the case at some English watering places.

medicinal operation of the water, which, though slow, and often not productive of immediate and sensible effects, is perhaps on that very account more suited to the class of chronic complaints in which mineral waters are usually employed.

Several highly efficacious springs have been discovered from the circumstance of diseased animals instinctively resorting to them, and recovering their health by immersing themselves in or drinking the water. Alibert says, “It is a known fact that at Vichy, in the month of April, the period when the snow melts on the mountains, when the wind has passed over the springs from the direction of Puy de Dome, and has carried the vapour to distances more or less considerable, the ruminating animals on the left bank of the Allier swim across the river to come and drink with avidity at the salutary springs of the establishment: the waters are then fit for use, and the people of the country are in the habit of saying the season has commenced, the beasts have passed across, — *les bêtes ont passé.*” The peasantry in the neighbourhood of mineral springs have been for centuries in the habit of using them, without altering their mode of living, in those cases which

experience had taught them they were likely to be benefited. Some invalids derive no benefit from one mineral spring, yet are greatly relieved on using another more suited to the nature of their disease, though the mode of life be the same at both places. Notwithstanding the inferiority of artificial to natural mineral waters, they are not unfrequently eminently serviceable, although the patients, instead of breathing the pure air of the country, and rising early in the morning to walk to the spring, continue to inspire the vitiated atmosphere of a metropolis, lie in bed during great part of the morning, and take no exercise except in a carriage ; in short, do not in the least change their usual manner of living. The power of mineral springs is further demonstrated by their prejudicial effects when used in cases for which they are not adapted, and also when incautiously used by persons in health.

Other examples might be brought forward, if necessary, to show that mineral waters are not the inert substances which many persons suppose ; but that, on the contrary, they are powerful auxiliaries in the removal and mitigation of

chronic disease, which require great caution in their administration, and should be employed not only when a disease has become inveterate, and as a last resource, as is often the case, but as therapeutic agents better suited to the treatment of many chronic diseases than pharmaceutical preparations, inasmuch as in these cases active medication frequently does harm, and the good effects of the treatment are generally more durable in proportion as they are gradually produced.

Others, however, far from regarding mineral waters as inactive, or even as a subordinate means of cure, are apt, either from a belief in their mysterious agency, or from other causes, to entertain exaggerated notions of their powers, and frequently use them in cases to which they are ill adapted; or, trusting entirely to their efficacy, neglect to make the necessary alteration in their habits and regimen, and to adopt other means of promoting their efficiency. Under such circumstances it is not surprising that disappointments should ensue, and that such persons should frequently leave the watering places in a worse state of health than on their arrival.



Several hypotheses have been brought forward to account for the mode of formation of mineral springs, and the phenomena common to most of them; such as the invariableness of their temperature, of the quantity of water they yield within a given period, and of their chemical composition: some springs are, however, liable to considerable variation in these respects, according to the seasons, the greater or less humidity of the atmosphere, its state of electricity, &c. The more generally received opinion respecting their formation is, perhaps, that which attributes their origin to atmospheric moisture in the form of rain and dew, which, sinking through the cracks and fissures of the soil in mountainous districts, penetrates deeper in the earth in proportion to the degree of pressure of the superincumbent column of liquid, and by its action on the different strata through which it percolates becomes impregnated with mineral particles, acquiring a higher or lower degree of temperature; which some have considered referrible to the central heat of the globe, and have endeavoured to prove that the elevation of temperature is in a direct ratio with

the depth at which a spring arises. These circumstances, however, are, and probably must ever remain, matters of conjecture. We must therefore rest satisfied at present with knowing that mineral springs are natural sources, arising at a greater or less depth from the bosom of the earth, laden with principles the medicinal virtues of which have been attested by experience; attentive observation of their effects upon the animal economy having shown that some springs are better adapted than others to the treatment of particular diseases.

As practical utility is the object of the present work, I shall abstain from entering into the consideration of geological details as connected with mineral waters, and beg to refer those desirous of information on the subject to the elaborate work of Dr. Gairdner on Thermal Springs. One circumstance, however, has attracted the attention of most authors who have written on mineral springs, — I allude to their close connection with volcanic action. It is well known that thermal, and especially sulphureous springs, abound most in volcanic localities; and the changes which have at times

taken place in certain springs have been clearly traced to the action of volcanoes. At the time of the great earthquake at Lisbon, many of the mineral springs of Germany and Switzerland experienced remarkable alterations in the temperature, chemical composition, and quantity of their water.

The mineralising substances contained in medicinal springs consist of the fixed or solid, and the volatile or gaseous. Among the fixed substances, alkaline and earthy bases, in combination with acids, forming sulphates, muriates, carbonates, &c.; some metals, as iron and manganese, silex, and a peculiar matter of an animal nature,—are those most frequently met with. The volatile principles are chiefly carbonic acid, sulphuretted hydrogen and nitrogen gases. The quantity and forms of combination of these substances vary exceedingly; nor is the efficacy of a spring always proportioned to the quantity of mineral particles which it contains. Some very efficacious springs yield on analysis but a small proportion of solid and gaseous parts; while some others, which contain a large quantity of mineral ingredients, do not

enjoy a high reputation in point of efficacy, though their operation may be more energetic. The following table from Osann's work will show the great disparity which prevails in the quantity of solid substance contained in different springs:—

*Large Quantity of Solid Substance yielded by Sixteen Ounces of Water of*

						Grains.
Pullna	-	-	-	-	-	182
Saydschutz	-	-	-	-	-	160
Seidlitz	-	-	-	-	-	126
Pyrmont (saline spring)	-	-	-	-	-	113
Kissingen	-	-	-	-	-	82
Marienbad (Kreutzbrunum)	-	-	-	-	-	70
Wisbaden	-	-	-	-	-	62

*Small Quantity of Solid Substance contained in Sixteen Ounces of Water of*

						Grains.
Wildbad	-	-	-	-	-	1
Gastein	-	-	-	-	-	1½
Pfeffers	-	-	-	-	-	2¾

The state of admixture and chemical combination in which the constituent parts are held depends upon several circumstances; as the greater or less degree of affinity which they bear to each other, their relative weight, the temperature of

the water, &c. In some waters the gaseous parts appear to be merely held in suspension, and very soon escape after the water has been taken from the spring, — this is the case with the waters of Hartfell, Cheltenham, and Tunbridge; in others, as Kissingen, Seltzer, Pyrmont, Spa, and Franzensbad, these parts are intimately combined with the water. The carbonic acid gas is in a state of closer combination with the water of the Weinbrunnen at Schwalbach, than with that of the Stahlbrunnen. In like manner, various saline, earthy, and metallic particles are often merely held in solution, being taken up by the water from the soil through which it percolates; whereas in other cases, intimate combinations are formed with the acids and gases. Hence it is evident why some springs bear exportation without material loss, and why others should be taken at the source in order to obtain the full advantage of their action. It is well known that water when heated will hold in solution a larger quantity of substance than when at a low temperature; as thermal waters cool, decomposition consequently takes place to a greater or less extent, and some

of the mineral particles are precipitated, forming a sediment at the bottom of the vase: such springs lose much of their power by exportation. On the other hand, cold waters which contain a small quantity of gaseous, but are rich in solid constituents, do not experience much change by exposure to the atmosphere: these may be kept long, and sent to a distance without materially losing their properties.

Much of the efficacy of mineral springs, no doubt, depends upon the state of intimate combination of the saline, metallic, and gaseous substances with the water. Daily experience in the practice of medicine demonstrates that the properties of medicinal agents are enhanced by pharmaceutical combination; and the difficulty of combining these substances as closely as they are found in a state of nature, is one reason for the superiority of natural over artificial springs. The state of dilution in which the various particles are held in mineral waters must also materially influence their operation, and produce effects very different from those which would be obtained by the same substances if exhibited in a

more concentrated form. To this circumstance the difference between their *modus operandi* and that of medicines is partly attributable. Nor must the temperature be overlooked in estimating their action on the body, though perhaps this circumstance has been somewhat overrated. Many physicians resident at bathing places assert that the caloric of mineral springs differs from the heat of ordinary water at the same temperature ; that the water of a hot spring is longer in cooling than common water artificially heated up to the same point ; and that it may be used without inconvenience at a temperature which in heated water would scald the mouth or produce vesication of the skin. The investigations of MM. Longchamp and Anglada have shown these statements to be erroneous ; that there is nothing in the heat of a mineral spring which can be considered to form an exception to the ordinary laws of caloric ; and that although the heat of a thermal spring must materially modify its operation, if the water could be artificially heated without decomposition of its constituent parts the same effects would result.

Mineral springs may be divided, according to their temperature, into

		Reaumur.		Fahrenheit.
Cold	-	below 15°	or	65°
Cool	-	from 15° to 20°	—	65° to 77°
Tepid	-	— 20° — 25°	—	77° — 90°
Warm	-	— 25° — 30°	—	90° — 98°
Hot	-	above 30°	—	98°

The greater number of mineral springs are cold, at a temperature varying from 8° to 15° R.; few are lower than 8°. Those of Bilin, Franzensbad, Pyrmont, and Marienbad have a temperature below 10°. Among the tepid springs may be mentioned Bagnolles, Buxton, and Schlangenbad; among the warm ones those of Eaux Bonnes, St. Sauveur, Pfeffers, Schintznach, and Baden, near Vienna. Of the hot springs may be enumerated Chandes-Aignes, Vichy, Mont d'Or, Bagnols, Bréges, Cauterets, Bagnères de Bigorre, Bourbournes les Bains, and Plombières, in France; Aix in Savoy; Bath in England; Leuk in Switzerland; Lucca, Ischia, and Castellamare, in Italy; Carlsbad, Toplitz, Wisbaden, Baden Baden, Aix-la-Chapelle, and Borcette, in Germany.



It has been already stated, that the salts which enter into the composition of mineral water in the largest quantity are sulphates, muriates, and carbonates: nitrates, borates, and phosphates are comparatively rare, and when existing they are generally in minute proportions. The principal of the sulphates is the sulphate of soda (Glauber's salt). This salt exists in large quantities in some hot springs, as Carlsbad; in smaller quantity in several others. In some cold springs it is also very abundant: a pint of the Pullna water contains no less than 90 grains: to it the Cheltenham waters likewise owe their action. The sulphate of magnesia predominates in several cold springs, which are termed bitter-purgings waters. A pint of Saydschutz water contains near 80 grains of this salt. Sulphate of lime is contained in many springs, particularly those of Switzerland and the Pyrenees. The water of Leuk contains a large proportion in comparison with the quantity of other saline matter. The muriates are extremely abundant both in hot and cold springs, especially the muriate of soda (common salt), which is contained in large or small proportions in

the greater number of mineral waters. Borcette and Wisbaden are the springs in which this salt is most abundantly found. According to Kastner, a pint of water from the Kochbrunnen at Wisbaden contains 44 grains. The Ursprung at Baden-Baden contains, in the same quantity of water, about half as much salt as the Kochbrunnen. The muriates of lime and potass are also found in several springs, but generally in small quantity.

Carbonates are also exceedingly copious in mineral springs. The carbonate of soda is the principal ingredient in many warm springs, and when in union with muriate and sulphate of soda is generally indicative of their volcanic origin; this salt being found in large quantity in the neighbourhood of volcanic mountains. According to Kastner a pint of Ems water contains 20 grains of carbonate of soda; the Carlsbad water has nearly 10 grains to the pint: 1000 parts of Vichy water contain 38·13 parts of this salt. In many springs, however, the quantity is very small. Carbonates of lime and magnesia also enter into the composition of several springs: the unctuousity or oily feel which some warm waters communicate to the

touch is generally ascribed to the presence of carbonate of lime ; though no doubt other ingredients contribute to this property, as the water of Schlangenbad, which possesses it in a high degree, does not contain more than a grain of this salt to the pint.

Carbonic acid gas forms an important component part of many springs : its presence determines the more intimate combination of the other ingredients, modifies the action of the water, and greatly promotes its efficiency, especially with respect to chalybeate waters. Those springs in which its action predominates over that of the other substances form a separate division, under the name of acidulous waters.

Mineral water, though usually clear, and resembling ordinary water in appearance, is occasionally turbid, and coloured by various substances. Its smell and taste are often characteristic. Thus an inky, astringent taste is peculiar to chalybeate springs : the odour of a sulphurous spring having been once experienced is not easily forgotten. Water containing much free carbonic acid has an agreeably sharp, cool, and piquant taste. The

predominance of carbonate of soda imparts a strongly alkaline taste, that of the salts of magnesia a bitter disagreeable taste, to the water in which they exist. Some waters have a taste and smell not unlike weak broth: this is attributable to matter of an animal nature, which has been termed glairine.

Mineral waters are strictly alterative remedies: their primary operation, mostly evidenced by increased activity of the secretory functions, is in many cases scarcely perceptible to the patient; and in these cases more benefit often results from their use, than in others where their operation is more sensibly felt at the time. Some produce their effects independently of any increase of secretion; such are chalybeate and some alkaline waters. Dr. Kreysig says a cure is often preceded by a state of indisposition, with retarded excretions, which is a sign by which the saturation of the humours by the mineral water is recognised. The same physician considers that the mass of humours becomes charged with the principles of the water, and that by this state is produced the tendency to evacuations truly critical, which

takes place in the following manner:—"The blood offers the most manifest signs of active expansion, and increased vital tension; the face becomes red and swollen, the pulse strong, the sleep agitated and interrupted; there is frequently a sense of weight in the limbs, with disinclination to muscular exertion; the belly is swelled if there be constipation; there is oppression of the chest, slight affection of the head, with weight and cephalalgia; the alvine evacuations are frequently suppressed, even in persons affected with diseases of the digestive organs without disposition to constipation. The indisposition frequently attains to such a degree that the patient scarcely dare continue the use of the water. After a fortnight or three weeks, sometimes later, a crisis suddenly takes place by evacuations from the bowels, and is followed by a prompt and general relief: the mineral water continues from this time to cause moderate evacuations, and to exert a salutary influence both on the local disease, and on the general condition of the patient."

"Others do not attain this point during the treatment, but, on the contrary, find themselves

worse ; and a fortnight or three weeks afterwards a change occurs, followed by abundant alvine evacuations, to which succeeds the cure or great relief of the patient."

" Again, other patients experience no alteration in their sufferings, neither before nor after the treatment. The waters appear to have been without any action on them. Such persons should be subjected, during the winter, to a treatment by medicines which have an analogous operation to the waters. The cure is frequently obtained in this manner, or at least it is prepared for the next season ; when, on resuming the use of the same waters, they are observed to produce a speedy effect, and cure as if by enchantment."

The use of mineral water is not in general admissible in diseases of an acute nature, or in those attended with febrile irritation or structural disorganisation of important parts. It is not unusual, however, for some of them to be occasionally prescribed to fulfil particular indications. Seltzer water and others of the same class are frequently allowed as a beverage in cases of acute disease. Saline purgative waters, as Seidlitz,

Cheltenham, or the salts derived from them, are very commonly employed in cases where the generality of mineral springs would be counter-indicated. A treatment by mineral water is applicable in some subacute affections ; in many chronic diseases, especially of the thoracic and abdominal viscera ; in some nervous disorders, and in many surgical complaints ; as also in deranged general health, without the existence of marked disease in any particular organ, but depending upon a residence in unhealthy climates, or in large towns, with too close attention to particular avocations, worry, domestic chagrins, mental anxiety, &c. In these cases, a course of mineral waters is often attended with the happiest result, and succeeds in restoring health after the failure of other means.

A course of mineral waters, or cure, as it is termed in Germany, generally lasts from four to five or six weeks : in many cases, however, a shorter course, of from two to three weeks, is recommended. During this period, the patient usually drinks from three to ten glasses of the water daily, the quantity being gradually increased,

and towards the termination of the cure gradually decreased. When bathing is exclusively recommended, or when the bath is combined with the internal use of the water, it is either taken daily in the morning, or two or three times a week, according to circumstances. These matters are, however, regulated by the resident physician at the baths, whom the patient consults, and without whose advice no one should commence the use of mineral springs. It is advisable for invalids to take with them a detailed statement of their case, written by their usual medical attendant, as this will be a much better guide to the physician who may be consulted than any account given by themselves. The water should always be drunk early in the morning, at the spring when possible, gentle walking exercise being taken at the time: when not easily digested, or when too exciting, it is usual to dilute it with milk, whey, or some other simple fluid. Two or three glasses are also generally taken in the afternoon. As other medicines interfere with the operation of the water, they should be abstained from, unless allowed by the physician.



Baths are usually taken in the morning, two or three hours after drinking, at a temperature between 86° and 96°. They increase the activity of the cutaneous circulation and secretion; perspiration being not unfrequently produced. They have also a sedative effect on the nervous system; the pulse becomes slower while in the bath, and a tendency to sleep frequently supervenes. Acting on the surface of the body, they produce a revulsion from internal organs, promoting their secretions, and diminishing visceral congestion. If taken at too high a temperature, baths act as stimulants; increasing the frequency of the pulse, causing copious perspiration, a feeling of general indisposition, with symptoms of increased irritation or of local congestion, as headach, giddiness, sleeplessness, a sense of oppression on the chest, &c. These symptoms may, however, depend upon the bath being used in cases to which it is not suited, or the individual being in a state of undue excitement from travelling or other causes. When existing in a trifling degree, they often spontaneously subside; but sometimes ne-

cessitate a suspension of the course, with recourse to other remedies for their removal. Some symptoms caused by the baths, as slight increase of indisposition, or of pains which previously existed, an itching or eruption on the skin, termed *poussée* or *pourpre de bain*, are usually considered by the physicians as precursors of the favourable effect of the water.

Invalids would do well to see that their bath be of the temperature prescribed, as the servants employed in the bathing houses are often more apt to judge of the degree of heat by the sensation communicated by the water to their semi-parboiled hand than by the thermometer: I have known very unpleasant consequences result from neglect in this respect. The period of remaining in the bath varies from twenty minutes to one, two, or even more hours. At some of the baths in Switzerland, which have not a very high temperature, the patients pass six or eight hours a day in the water. Baths of mineral water are generally contra-indicated in states of plethora, fever, great irritability or debility of important organs, as the heart, lungs, stomach, and bowels,

in organic visceral disease, tendency to cerebral congestion, and pregnancy.

Douches and vapour baths are more exciting than water baths: they are mostly used in cases of local debility, scrofulous swelling, muscular rigidity, contracted or anchylosed joints, neuralgic pains, and some affections of the senses, as deafness. Douches are frequently administered while the patient is in the bath, and are often combined with friction. At some bathing establishments, as Aix-la-Chapelle, male and female rubbers are employed. At many thermal springs the vapour is inhaled in affections of the lungs and air-passages; the internal or external use of the water being at the same time enjoined. The mud or sediment deposited at the bottom of reservoirs of mineral water is not unfrequently used as a local application in cases of obstinate ulcers, rheumatic or gouty pains, with enlargement of the joints, indurated glands, and other tumours, &c. Mixed with water, the mud is occasionally used in the form of general bath.

As materially conducing to the success of the

treatment, regular hours, early rising, exercise in the open air, a plain and abstemious diet, the avoidance of highly seasoned, dried, salted, or pickled dishes, and sour wine, as well as of sources of mental annoyance or fatiguing avocation, and of crowded evening assemblies, are strongly insisted on.

It has been questioned whether manufactured mineral waters can produce effects analogous to those of the natural springs. The accuracy with which chemistry has determined the composition of mineral springs admits of a pretty close imitation of several among them; and those of a low temperature, which are not readily decomposed, may very often be superseded by artificial waters, which have the advantage of being used under the superintendence of the ordinary professional attendant, and are highly useful in those cases where persons can neither spare the time nor money for a long journey and residence at a watering place. This class of remedies are thus placed within the reach of many of the population of large towns, who are unable to visit the natural sources; which, however, should always be pre-

ferred by those whose circumstances and time are not limited.

Various classifications of mineral waters have been made by those who have written on the subject. Some have contented themselves with dividing them into the alterative, comprising the greater number of springs, and the tonic or chalybeate. They have been divided by others into the sulphurous, saline, chalybeate, and acidulous or gaseous. By Osann they are divided into seven classes, viz. iron, sulphurous, alkaline, bitter, Glauber salt, saline, and acidulous waters : each of these is again subdivided according to the predominance of their alkaline, saline, earthy, ferruginous, or other component parts. There must, however, always be considerable difficulty in the classification of mineral springs, as many cannot be referred to one division more than to another, on account of the mixed nature of their properties, and different effects in different cases. In general the division to which a spring belongs should be determined more by the nature of the substance which gives to it the peculiar properties by which it is distinguished from others, than by

the larger quantity of any particular ingredient; as the action of the water on the animal economy is often different from what might be expected on looking merely to its chemical composition: hence the study of the therapeutic effects of mineral waters is more important than that of the exact relative proportion of their different constituent parts. Chalybeate waters contain but a small quantity of iron in comparison with the quantity of saline substance, and would be placed under a different division were their chemical composition to be exclusively considered; yet their tonic action on the human body sufficiently points out the class to which they belong. In the following pages I have ranked the mineral springs under the following heads; viz. sulphurous, chalybeate, saline thermal, saline aperient, alkaline, acidulous, which will be a sufficiently minute division for all practical purposes.

It will be seen that although the same diseases are often mentioned as likely to be benefited by different springs of the same class, or even by springs belonging to different classes, which may appear to some a needless reiteration, yet that

some springs are more adapted to particular cases than others which apparently contain the same elements. It is not to be expected that any work on mineral waters can do more than point out the general indications for their medicinal application: the diversity of symptoms, peculiarities of constitution, idiosyncrasy, and other circumstances require to be considered in individual cases, in order that the practitioner may be enabled to form a judgment as to the particular spring most likely to be applicable to any given case. Of two persons similarly affected to whom a course of sulphurous waters is prescribed, one will find his sufferings speedily alleviated, while the other will obtain no benefit, but will derive great advantage on using a spring of a different class: this is difficult to be accounted for, and in many instances can only be ascertained after the trial has been made.

## SULPHUROUS SPRINGS.

THE class of sulphurous waters is one of the most important and efficacious in the removal of many intractable diseases. The sulphur exists most frequently in combination with hydrogen gas, on which account these waters do not in general bear exportation. Carbonic acid gas and various salts, sometimes in large quantity, also enter into their composition. As they are exceedingly stimulating, their use requires much caution and discrimination, especially in weak persons of an irritable and nervous temperament, and in those disposed to congestion of the brain or lungs, or to hemorrhagic affections. Their action varies according to the manner of their exhibition, and to the peculiarities of individual cases. Used in the form of bath, their primary operation is on the skin, increasing the activity of its capillary circulation and secretion, and on the absorbent system: their operation upon the mucous membranes and viscera being consequent to their action on the surface. Internally taken, they act primarily



upon the mucous membranes of the stomach and bowels, of the air passages or urinary organs, according to circumstances, generally exciting the secretion of bile, and the abdominal venous circulation: thus their sensible operation is aperient, diaphoretic, diuretic, or expectorant, according to the manner in which they are used, the constitution and disease of the patient, the nature and quantity of the saline substances they contain, &c. They may generally be employed with advantage in some atonic conditions of the circulation, especially of the abdominal venous system, giving rise to piles and hepatic obstruction; in affections of mucous membranes accompanied with increased secretion, as chronic disease of the urinary apparatus with mucous discharge, and chronic pulmonary catarrh. In cutaneous and rheumatic affections they frequently prove more efficacious than any other class of remedies. Among the most powerful waters of this class are those of Aix-la-Chapelle, Baden near Vienna, Harrowgate, and the Pyrenees.

## AIX-LA-CHAPELLE.

The springs of Aix-la-Chapelle are of very high antiquity, and still retain the celebrity which they have for ages enjoyed. To them the town owes its name, the German term Aachen being a derivation from the Latin word *Aquæ*. Aix-la-Chapelle is delightfully situate at the foot of a chain of hills in a well wooded and fruitful valley, enclosed by gentle risings of ground clothed with verdure. But little of its former magnificence now remains: its gates and walls have been demolished; and the ramparts, planted with limes and chesnut trees, are converted into an agreeable promenade. The most remarkable public edifices are the Hôtel de Ville, and the Cathedral or Chapelle, built by Charlemagne, where his remains till lately reposed. The hotels and bathing houses are numerous, elegantly fitted up, and provided with every requisite apparatus for the use of the springs, whether as baths, douches, or vapour baths. Several spacious new streets have been formed within the last few years on account of the increased influx of visitors. The popula-

tion amounts to about twenty-seven thousand. During the season, which begins in June and terminates in September, the town presents a very animated appearance: a French company performs at the new theatre; and the Redoute, a building for restauration, evening assemblies, and games of hazard, is open daily. Play is under the superintendence of government, an employé being always in attendance to enforce the regulations and prevent any of the inhabitants risking their money. Few visitors remain after September, as the coolness of the atmosphere in autumn would tend to counteract the operation of the water. Some invalids, however, who do not bathe remain a few weeks later.

The environs abound in pleasant drives and rides, which add greatly to the attraction of Aix-la-Chapelle as a summer residence. The favourite resort of the inhabitants is to Louisberg, a hill close to the town, of which it commands a good view, as well as of the small town Borcette, and the richly variegated scenery of the surrounding country.

The principal point of reunion both for drinkers

and idlers is at the *Fontaine Elise* and the adjoining promenade. Drinkers descend to the fountain, which is about twenty feet below the surface of the ground, by a stone staircase on either side, and have their glasses filled by females, who are thus constantly employed at drinking hours. A handsome portico in front of the spring enables invalids to take walking exercise in wet weather; there are also apartments for refreshment and for an excellent musical band, which is in attendance morning and evening. This fountain is supplied from the *Source de l'Empereur*, the water being conveyed through pipes under ground.

Six springs, divided into the superior and inferior, rise within the town: their proximity is evidenced by the smell peculiar to sulphuretted hydrogen. They belong to the division of alkaline sulphurous thermal waters. When drawn from the fountain the water is clear and colourless; but on exposure to the air it soon loses its gaseous parts, with its sulphury smell and taste, and deposits a whitish sediment. The three superior springs rise near to each other, are hotter.

and abound more in sulphur than the inferior ones, which rise at a little distance in a lower quarter of the town. The *Source de l'Empereur*, which is the hottest, and contains the largest quantity of sulphur, is most employed; its temperature is 130° Fahrenheit. It supplies the *Fontaine Elise* and three bathing houses; the bain Neuf, the bain de l'Empereur, and the bain de la reine d'Hongrie.

The *Source de St. Quirin* is another of the superior springs, which rises in the bathing house of the same name; its temperature is 115°. The temperature of the inferior springs does not exceed 112°; they are termed the sources de la Rose, St. Corneille, and St. Charles. Some bathing houses and a drinking fountain are supplied from these springs, which are less exciting than the superior ones, and can frequently be employed in cases where the latter would disagree.

Besides its sulphurous springs Aix-la-Chapelle possesses some chalybeate ones, to the use of which a bathing house is appropriated. As the iron in these springs is less intimately combined with the other constituent parts than in those of Spa, and

others of the same class, they are less adapted for drinking than for baths.

In addition to sulphur and sulphuretted hydrogen gas, the water of Aix-la-Chapelle contains carbonic acid gas; muriate, carbonate, sulphate, and phosphate of soda; with a small proportion of lime, magnesia, and strontian. Used in the form of a bath, its action is extremely penetrating and stimulating, producing diaphoresis, with general relaxation of the system. It is liable to cause determination of blood to the brain and lungs in persons who are thereto predisposed, and is consequently contraindicated in cases where this tendency exists; as also in individuals of a full habit of body, in those subject to active hemorrhage or to great irritability of the vascular system, and in cases of organic disease of the heart or other important viscera. It is better suited to cases in which torpor or atony is the prevailing character, and to persons of lymphatic constitution. Taken internally it is alterative, and generally aperient, affecting especially the lower intestines; it also acts, in particular cases, upon the mucous membranes of the air passages

and urinary organs ; on the liver, promoting the abdominal venous circulation ; on the absorbent vessels and glands ; and on the skin. By combining the internal use of the water with baths, the inactivity of the bowels sometimes induced by bathing is obviated.

A course of these waters is serviceable in most cases where the object is to act gradually, though powerfully, upon the skin, mucous membranes, abdominal viscera, nervous and absorbent systems ; as in obstinate rheumatic or gouty affections, with calcareous concretions in the joints ; contraction or loss of power of the limbs ; paralytic cases, when not dependent upon cerebral disease ; intestinal and hepatic inactivity ; piles ; hypochondriasis ; disordered health from residence in unhealthy climes, abuse of mercury, or other causes ; some cases of neuralgia, when not attended with great irritability of the system ; asthma and chronic bronchitis, with increased secretion, especially in old persons ; some chronic diseases of the skin, as scabies, impetigo, psoriasis, lepra, and prurigo ; enlargement of the lymphatic glands ; vesical catarrh, with tendency to the

formation of stone ; leucorrhœa, and other mucous discharges of long duration. Dr. Alertz is one of the most esteemed among the resident physicians.

*Analysis of a Pint of Water from the Source de l'Empereur, by Monheim.*

	Grains.
Sulphur - - - - -	0·620
Muriate of Soda - - - - -	20·716
Sulphate of Soda - - - - -	2·121
Carbonate of Soda - - - - -	6·610
Phosphate of Soda - - - - -	0·140
Animal Substance - - - - -	0·294
Silex - - - - -	0·540
Fluate of Lime - - - - -	0·479
Carbonate of Lime - - - - -	0·232
Carbonate of Magnesia - - - - -	0·152
Carbonate of Strontian - - - - -	0·043

---

31·953

	Cubic Inches.
Carbonic Acid Gas - - - - -	$8\frac{4}{9}$
Sulphuretted Hydrogen Gas - - - - -	$13\frac{1}{2}$

} according to Kortüm.

#### BORCETTE,

Or Burtscheid, as it is termed in Germany. This pretty town lies within a mile of Aix-la-Chapelle, and contains a population of 6,000



souls. It possesses several hot springs, which, like those of Aix-la-Chapelle, are divided into the superior and inferior. The superior springs are not sulphurous, but belong to the class of saline thermal waters. They are impregnated with carbonic acid gas and azote; the quantity of these gases being, according to Monheim, 27 cubic inches to the pint of water from the Kochbrunnen, or boiling spring, which is one of the hottest in Germany, its degree of temperature being 150°. This water also contains muriate of soda in large quantity, a small quantity of carbonate and phosphate of soda, with a minute proportion of fluuate and carbonate of lime, carbonate of magnesia and strontian, animal matter and silex. The other superior springs, though less hot, do not materially differ in composition from the boiling spring. Five bathing houses are supplied by these springs. As they resemble the water of Wisbaden in their composition, so also in their action, which will be considered when treating of this class.

The inferior or sulphurous springs are not unlike those of Aix-la-Chapelle, though less rich in

sulphur. A well for drinking the water, on the public promenade, is supplied by one of these springs; a second supplies the principal bathing house, La Rose; the third is termed the Pockenbrunnen, on account of its reported efficacy in the removal of some cutaneous affections.

The bathing houses are commodious, and well supplied with requisites for water and vapour baths, and douches. As the waters of Borchette are less heating than those of Aix-la-Chapelle, they may be used in some cases where the latter are inadmissible, and are not unfrequently employed preparatory to a course of the stronger springs. The presence of saline and sulphurous waters in the same town is highly advantageous to many patients, who are greatly benefited by drinking the former while under a course of sulphurous bathing.

#### BADEN

Is a clean and pretty town, situate two posts from Vienna, at the foot of the Styrian mountains, and is almost entirely encircled by hills.

It contains about 5000 inhabitants, and can lodge nearly as many visitors, which consist for the most part of Viennese, who find at Baden a pleasant retreat from the metropolis during the summer months. The bathing houses in the town are numerous and convenient; the suburb is, however, considered the most eligible quarter. Here is placed the Sauerhof, or principal lodging and bath house, in the saloon of which the public assemblies and balls are held; these, with the theatre, are the principal amusements in the season, gaming being prohibited at Baden, as at other watering places in the Austrian territory. A band is in attendance at stated hours in the public pleasure ground near the Ursprung.

The environs of Baden are extremely interesting: the drive from the end of the suburb along the delightful valley of Hellenenthal, presents a succession of scenery which for variety and picturesque beauty can scarcely be excelled. Weilburg, a handsome modern château, belonging to the Archduke Charles, stands near the town, in a position commanding a fine prospect of the valley, which, narrowed at some parts by lofty hills of various

forms, clothed with beech and pine, or by enormous masses of greyish rock, which contrast strikingly with the surrounding verdure, occasionally expands into meadows of the brightest green, separated by a small river over which neat bridges have been constructed. Beyond the convent of Heiligeekreutz the aspect of the country is altered; an extensive pine forest, with numerous grassy glades, hills thickly wooded to their summits, cultivated valleys and populous villages, vary the scene, and are again exchanged, on advancing towards Brühl and Mödling, for scenery of a wilder and more sombre cast: dark rugged rocks several hundred feet high, and totally destitute of vegetation, on whose sides and tops galleries and artificial ruins have been formed by the taste of Prince Lichenthal, remind the Alpine traveller of the desolate grandeur of the Saint Gothard. In fact, the country between Baden and Mödling presents a greater variety of scenery than could perhaps be met with elsewhere in the same space, and well deserves the name which has been bestowed upon it, of the miniature Switzerland.

Numerous springs arise in the town and neighbourhood; their chemical composition is much the same in all. The temperature, however, varies. Those of the first class, viz. the Ursprung, Josephsbad, and Frauenbad, are at  $29^{\circ}$  or  $30^{\circ}$  Reaumur; the temperature of the Sauerbad, Autonsbad, Herzogsbad, Leopoldsbad, Armenbad, Theresienbad, and Petersbad, is from  $27^{\circ}$  to  $28^{\circ} 50'$ ; that of the Engelsburgbad, Mariazelbad, and Pereginusbad, is somewhat lower. They belong to the division of the stronger saline sulphurous springs.

The action of these waters is analogous to, though less powerful than, those of Aix-la-Chapelle, being modified by their lower temperature, their smaller proportion of gas and saline substance. The water is more used for bathing than drinking, and not unfrequently causes an eruption on the skin; it is more especially recommended in chronic gouty and rheumatic cases, muscular rigidity, hysterical and other nervous affections unattended with a high degree of excitement, hemorrhoids, leucorrhœa, chronic bronchitis, glandular enlargement, chronic eruptions, and ulcers.

Douches, shower and vapour baths, and injections of the water, are much employed in suitable cases.

*Sixteen Ounces of the Water, analysed by Schenck, yielded*

			Grains.
Muriate of Soda	-	-	- $3\frac{2}{3}$
Sulphate of Soda	-	-	- $1\frac{1}{3}$
Sulphate of Lime	-	-	- $3\frac{2}{3}$
Carbonate of Lime	-	-	- $4\frac{2}{3}$
Sulphate of Magnesia	-	-	- $2\frac{1}{3}$
Earthy Matter	-	-	- 1
Carbonate of Magnesia	-	-	- $2\frac{1}{3}$
			<hr/>
			19
			<hr/>
			Cubic Inches.
Sulphuretted Hydrogen Gas	-	-	- $3\frac{4}{9}$
Carbonic Acid Gas	-	-	- $1\frac{7}{9}$

#### AIX LES BAINS.

The mineral springs of Aix, in Savoy, are of high antiquity, having been employed from the time of the Romans, by whom the place was called Aqua Gratiana. The baths lie at the foot of Mount Revel, two leagues from Chambery, and twelve from Geneva, and are surrounded by a delightful country. They are much resorted to in the season, both by persons from the neigh-

bouring districts, and by others from more distant parts, attracted by the reputation of the waters. The walks and drives are pleasing and varied, the accommodation is good, and living not expensive.

Two springs are mostly used; the sulphur spring, and the so-termed alum spring, which, however, contains none of this salt, but is also sulphurous and slightly saline, though not gaseous. The sulphur spring has a sweetish earthy taste, and strong sulphurous smell; its temperature is  $38^{\circ}$  R. Besides a large quantity of sulphuretted hydrogen and carbonic acid gas, it contains carbonate of lime and magnesia; sulphate of lime, soda, and magnesia; muriate of soda, and animal extractive.

A course of these waters may be tried in most of those cases to which sulphurous springs are applicable, especially in long-standing pains of a gouty or rheumatic nature, chronic paralysis, old wounds, and ulcers. Aix les Bains is also much frequented by invalids with functional derangement and torpidity of the digestive powers, scrofulous affections, intractable nervous complaints, chronic pulmonary catarrh; and by those

labouring under general weakness and deranged health from excesses, the long-continued suckling of children, &c.

As the water soon changes, it is usually drunk at the spring ; and when found too exciting, is diluted with milk or ordinary water. Baths are likewise sometimes diluted with common water, and are mostly taken in the lodging houses ; the piscinæ, or public reservoirs, being mostly used by poor persons. Douches and vapour baths are much employed.



## SULPHUROUS SPRINGS OF THE PYRENEES.

NOWHERE within the same space will be found so great an abundance of mineral springs, most of which are sulphurous, as among the valleys of the French Pyrenees; nor are there at any other watering places more *agrémens* for a summer residence, or more resources for bodily and mental recreation. Living is not expensive; the towns and villages have a cleanly, attractive appearance; the accommodation is of the best kind; the society good; the population primitive in their manners, honest, intelligent, and obliging; the land fertile and well cultivated. Nowhere does there exist a greater variety of pleasing scenery,—from the cheerful aspects of the beautiful, fertile, and populous villages, intersected by numerous rivulets of the clearest water, to the sterility and grandeur of the mountain ranges, where the stillness is unbroken save by noise of the impetuous gaves forcing their way to the plains below. The various *pics*,—Marboré; the Brèche de Roland; Mont Perdu; Gavarnie, with its mountain amphitheatre and its cascades,—are

but a few of the objects which attract the visitor's attention in this region. These advantages, together with the benefits which hundreds annually derive from the waters, sufficiently account for the preference given to this part of France by those who repair *aux eaux* either for health or amusement.

The eastern department of the Pyrenees is also rich in natural beauties, and in thermal waters, mostly sulphurous, of which L'Escaldas, Le Vernet, Vinça, and La Preste, are the most celebrated. As, however, these places are comparatively seldom resorted to, and the accommodations are very inferior, while they present no advantages, except to those who desire solitude, over the more frequented springs of the central and western Pyrenees, I shall abstain from giving an account of them, and refer those desiring information on the subject to the work of M. Anglada—"Traité des Eaux Minérales, et des Etablissements Thermaux, du Département des Pyrenees-Orientales. Paris, 1833."

## BAREGES.

This village consists of about eighty houses, forming a narrow street by the side of a *gave* or mountain torrent, is situate in a cheerless spot, enclosed by steep, pine-covered, and snow-tipped mountains, and is uninhabitable during six months of the year. Avalanches frequently fall in the winter and spring, destroying part of the village; and the torrent, when increased by heavy rains or the melting of the snow, not unfrequently carries away some of the houses, which are rebuilt on the approach of the season; during which Baréges is crowded with persons of all ranks, and offers better accommodation than might be expected. It would, however, be advisable for families intending to make any stay, to secure apartments beforehand. A *café* in the centre of the village serves as a point of reunion for reading the papers, playing at billiards and games of chance.

These springs are said by some to have been known to the ancient Romans; others attribute their discovery to a sheep, which was observed to

stray daily from the flock, and direct its course towards them: the people of the country soon became acquainted with their efficacy. They were, however, not frequented till Madame de Maintenon being at Bagnères on account of the health of the young Duke de Maine, and hearing of Baréges, took the duke thither. Since that period they have been greatly resorted to by invalids from all parts, especially by wounded military men. An hospital is established by government for common soldiers whose cases are likely to be benefited by the water.

Baréges presents more space for walking exercise than might at first view be imagined; the spots in the immediate neighbourhood most frequented are *Le Sopha* and *L'Héritage à Colas*, whence are seen numerous mountain *pics*, which those who are able to make longer excursions will be gratified in exploring. The towns of Luz and St. Sauveur are within a short drive; and Gavarnie, the Brèche de Marboré, De Roland, and Mont Perdu are not distant.

Six springs are used,—viz.

				Degrees of Temperature.
Polard	-	-	-	38°20
La Temperée		-	-	33°00
Le Fond	-	-	-	36°25
La Douce		-	-	44°38
L'Entrée	-		-	42°00
La Chapelle		-	-	28°45

The water is perfectly clear, and does not taste strongly of sulphur; but the smell is very decided. It is mineralised principally by the sulphuret of sodium; but also contains carbonate of soda, a small quantity of sulphate and muriate of soda, azote, sulphuretted hydrogen, and glairine or animal matter. Taken internally it often produces, like other sulphurous waters, a degree of excitation, marked by acceleration of the pulse, perspiration more or less abundant, increased appetite, and sometimes sleeplessness. It is not in general purgative, and even sometimes induces constipation, particularly when exclusively used for bathing; but is diuretic, diaphoretic, and expectorant. By its local or general stimulating properties, it cleanses foul ulcers, lessens the induration of callous and fistulous sores, promotes the exfoliation of carious portions of bone, and

cicatrizatio*n*, frequently causing foreign bodies which had long been imbedded in the deeper textures to advance towards the surface. It is also highly efficacious in allaying long-existing pains, whether of a rheumatic nature or arising from wounds; in remedying the stiffness and immobility of joints when these symptoms depend upon tumefaction of the soft parts; in hemorrhoidal affections, jaundice, and chronic disorders of the chylopoietic viscera, especially long-standing dysentery; in chronic syphilitic diseases, and those resulting from the abuse of mercury; in strumous swellings, dry asthma, and chronic bronchitis, when not attended by much secretion. In cases of humid asthma the water at Cāuterets generally agrees better than that of Baréges.

As no one would be induced to select Baréges for a summer residence, the numbers who annually resort thither afford the highest proof of the efficacy of the water. It may be questioned, however, whether the springs possess properties superior to others of the same class having nearly the same chemical composition: most probably the establishment of a military hospital tended to

procure for Baréges a greater reputation than other springs in cases of ulcers, gunshot wounds, and their consequences—pains, contraction, and wasting of the limbs.

Most invalids both drink and bathe, the water being used either in its natural state or diluted. It is usual to commence with the temperate springs before using the hotter ones.

The season begins on the 1st of June, and terminates in September. About seven hundred visitors can be lodged exclusive of the military.

## ST. SAUVEUR

Is situate about two leagues south-west of Baréges, in a narrow valley enclosed between two mountains, whose almost perpendicular sides are covered with trees and brushwood, and on an elevated plateau commanding a delightful view of the valley and town of Luz. The village consists of two rows of houses, with balconies and slanting slated roofs, producing by their contrast with the surrounding scenery a novel and pleasing effect. In the centre of the street stand the two principal

buildings,—the church and bathing house. Lodgings are more commodious, and easier to be procured than at Baréges; the best, however, which overlook the valley of Luz, are generally secured early in the season. A single room costs from a franc to two francs per day, each bath a franc and half; a horse for the day three francs. The same prices obtain at most of the Pyrennean springs. Those who dislike dining at the tables d'hôte, can be served in their own apartments, by a *traiteur*, at so much per head. Public assemblies and balls take place at the Vauxhall once or twice a week.

Paths easy of ascent, and furnished with seats, are cut among the hills, leading either to cascades, to platforms whence a more extensive view of the country may be obtained, or to secluded spots well shaded by clumps of trees. The Garden à l'Anglaise and Bellevue are the most frequented promenades: the Desert on the mountain opposite, which is reached by a bridge thrown across the *gave*, is also one of the most frequented spots. Good and sure-footed ponies are always to be had for those who prefer this mode of taking exercise,



and for distant excursions. Gavarnie, with the remarkable objects in its neighbourhood, is nearer to St. Sauveur than to any of the other watering places.

St. Sauveur possesses only one mineral spring, which is chiefly used for bathing and douches. In composition it greatly resembles those of Baréges; but its temperature is lower ( $28^{\circ}$  R.), and it is better supported by persons of delicate constitution. Having acquired a reputation for the relief of diseases peculiar to females, the greater number of invalids at St. Sauveur are ladies; while at Baréges the number of the male sex predominates. As, however, the places are so near to each other, constant communication and interchange of visitors take place; the spring at St. Sauveur being considered as an appendage to those of Baréges. A course of the water is said to be very efficacious in cures of nervous disorders, bronchial irritation, nervous asthma, catamenial derangement, and may be used for many of the diseases which have been named under the head of Baréges.

## CAUTERETS.

Cauterets lies seven leagues west of Baréges, in the tranquil valley of Lavedan, surrounded by dark forests of pine, which form a strongly marked contrast with the whiteness of the houses, and the lighter verdure of the meadows, through which flow streams of clear water, falling occasionally in cascades. The town is clean and well built; the promenades are delightful and varied; many interesting points for excursions lie in the vicinity; and the springs are in high repute, their number and the difference in their composition enabling the physicians to adapt them to various indications: hence Cauterets is one of the places in the Pyrenees most resorted to by those who seek recreation, mental relaxation, or relief from disease.

Ten springs rise in and about the town. Some of them, viz. Bruzaud, La Reine, Posé, and Cesar, are situate at a little distance on the acclivity of a hill, termed Pic du Bain; the others, which rise within the town, are termed La Railliére, Le

Petit St. Sauveur, Le Prè, les Sources de Mahourat, des Œufs, et du Bois.

The spring Bruzaud has a temperature of 32° R. Its bathing establishment is commodious, consisting of a drinking fountain, a douche, and twelve bathing cabinets, a large portico, a saloon for refreshment, a garden with shady terraces and platforms. The temperature of the Posé is 36° its establishment is similarly organised to that of Bruzaud. The springs La Reine and Cesar are somewhat hotter—40°. At La Reine there is a special douche for rheumatic patients.

La Railliére stands foremost among the springs of Cauterets, and the reputation of its efficacy has always attracted many invalids. The establishment comprises twenty-four bathing cabinets, a central drinking fountain, a fine portico, a large saloon, two smaller ones, and apartments for warming linen. The temperature of the water is 21°. Le Petit St. Sauveur, so called from the resemblance of its water to that of St. Sauveur, has a temperature of 24°. The spring Le Prè (28°) is considered to be the most powerful in the Pyrenees, and is only used for bathing ; while

the water of the Source de Mahourat is used exclusively for drinking. The Sources des Œufs and du Bois are not much employed.

Like the other sulphureous springs, those of Cauterets are limpid, of a somewhat disagreeable taste and smell, and feel soft to the touch. They do not contain a large quantity of salts, which are sulphuret of sodium, carbonate of soda, carbonate of lime, and magnesia. They also contain nitrogen gas, a small proportion of silex, and animal matter.

It was long supposed that sulphuretted hydrogen was the chief mineralizing principle of these Pyrennean springs; but according to the recent investigations of MM. Anglada and Orfila, there is no evidence of the existence of this gas in water drawn at the springs, where the sulphur always exists in combination with soda, forming a sulphuret of sodium. Although the water has scarcely any smell of sulphuretted hydrogen at the springs; yet where the drinking fountain or the baths are at a distance even of fifty feet, the sulphuret of sodium becomes decomposed during the passage of the water through the pipes, and

this gas is consequently disengaged, its peculiar smell becoming very evident. Of the springs at Cauterets, the Cesar and Posé are much more strongly impregnated with sulphur than La Raillière, Mahourat, Du Prè, and Le Petit St. Sauveur.

The water of La Raillière is more particularly employed by persons whose digestive powers have become weakened; by those in whom chronic bronchial or laryngeal disease, or a tendency to phthisis, exists; in cases of asthma; derangement of the general health, from excesses or dissipation; and in nervous complaints. Three or four glasses, either pure or diluted, are drank in the course of the day. Baths and semi-baths are also much used: the latter, in which only the inferior half of the body is immersed in the water, frequently allays nervous irritability, without causing the oppression and debility which occasionally follow entire baths.

The Posé water is preferred in cases of chronic rheumatism, bronchitis with copious expectoration, the humid variety of asthma, long-standing complaints of a syphilitic origin, scrofulous tumours and ulcers, and cutaneous diseases of the dry scaly kind. The Cesar spring fulfils the same

indications as the preceding; but on account of its energetic action is more adapted to individuals of a torpid and lymphatic temperament. It is much used in paralytic complaints, in those affecting the osseous system, and in the more intractable forms of scrofula. The springs Du Pré and Du Bois are mostly used for bathing and douching in cases of rheumatic gout, and some affections of the skin. Le Petit St. Sauveur is said to have great power in nervous disorders, hemorrhoids, uterine irritation, especially in cases of enlargement of the neck of the uterus, with a normal sensibility to the touch; in this kind of cases patients are generally advised to drink of the water of La Raillière, after the symptoms of irritation have subsided. The water of Mahourat is recommended in derangement of the digestive powers, unaccompanied by inflammatory irritation.

The water of Bruzaud, drawn at the bathing establishment, contains no sulphur, but in lieu thereof a large proportion of sulphate of soda. M. Orfila, who first ascertained this point, accounts for the absence of sulphur by the circumstance

that the establishment is placed considerably lower than the spring, which, like the others, contains sulphuret of sodium at the source ; but in consequence of the distance which the water flows in a large aqueduct, composed of bricks badly cemented together, which admits the access of air, it loses its sulphureous property, from the oxygen of the atmosphere combining with the sulphuret and transforming it into a sulphate of soda. The temperature is also much higher at the spring than at the baths, being  $39^{\circ}$  at the former and only  $32^{\circ}$  at the latter. Yet notwithstanding its deterioration, the spring is very serviceable in several diseases, especially in cases of abdominal obstruction ; its action being more purgative than that of the others, owing to the sulphate of soda.

Rieumiset, in the immediate vicinity of Cauteret, has a bathing establishment, which, in point of elegance and convenience, leaves nothing to be desired. The water is very similar to that of the Bruzaud, but contains less sulphate of soda. It is often recommended in cases accompanied with nervous irritation, and also to allay the undue

excitement which the use of the other springs sometimes occasions.

#### BAGNERES DE BIGORRE.

The springs of Bagnères de Bigorre are of three kinds, viz. saline, chalybeate, and sulphurous; the saline ones are most numerous, and it is chiefly on account of these that invalids repair to Bagnères: a more full account will therefore be given when the class of saline waters comes under consideration. The sulphureous springs are cool, their temperature being no higher than  $12^{\circ}$ ; the solid constituent parts do not materially differ from those of the other springs, though the quantity is smaller. They contain azote and sulphuretted hydrogen, or, according to Anglada and Orfila, sulphuret of sodium; they are much less active than the hotter springs of the same class, and are termed Pinac, Labassère, and D'Aranou. The two last are nearly two leagues from the town.



## BAGNERES DE LUCHON.

Fine avenues of limes and sycamores line the approaches to this delightful little town, which, built in the form of a triangle, is situate twenty leagues to the south-east of Bagnères de Bigorre, in the beautiful and rich valley of Luchon, not far from the Spanish frontier. Numerous handsome houses and villas embellish the lime avenue, which leads from the town to the principal spring. This is considered the preferable part for a residence, and is the usual evening promenade. The accommodation at Bagnères de Luchon is excellent, and upwards of a thousand visitors can be conveniently lodged.

Few watering places possess more agreeable promenades or more inducements for excursions in the environs. The varied mountain scenery; the valleys of the brightest green, populous, richly wooded, and freshened by streams of the clearest water; the numerous waterfalls, especially Montauban and Juset,—will afford the highest gratification to lovers of the picturesque; while those who delight in reading or the enjoyment of society

will equally find opportunities for gratifying their tastes.

Eight springs are employed,— viz.

<i>Temperature.</i>				Reaumur.
La Grotte supérieure	-	-	-	58·75
La Grotte inférieure	-	-	-	58·75
La Reine	-	-	-	51·25
Richard	-	-	-	51·25
Des Yeux	-	-	-	38·50
Ferras .	-	-	-	36·70
La Blanche	-	-	-	25·00
La Froide	-	-	-	22·50

The water contains hydro-sulphuret of sodium, carbonate of soda, a little muriate and sulphate of soda, lime, and silex ; and is used both for drinking and bathing. The establishment is well arranged, and in good order ; being, as at most French watering places, under the superintendence of an inspector appointed by government, and is composed of three buildings, each containing forty bathing cabinets, douche and vapour baths.

From the difference of temperature and proportion of mineralising substance, these springs fulfil various indications : like others of the same class, when used as baths, their primary operation

affects the capillary circulation of the surface, producing perspiration, and sometimes an eruption. As they not unfrequently occasion constipation of the bowels, aperients, exhibited occasionally during the course, are requisite.

In rheumatic and some cutaneous affections, as psoriasis and eczema, these springs are said to be more efficacious than those of Cauterets and Baréges, although the latter are preferable in cases of wounds, ulcers, and foreign bodies lodged in different parts; their action has great analogy with those of Aix in Savoy. Persons labouring under glandular tumours, piles, catamenial suppression or obstruction, and leucorrhea, frequently find relief from a few weeks' residence at Bagnères de Luchon. The springs are less suited to cases of irritation in the abdominal or thoracic viscera, or to those attended by high nervous irritability.

## EAUX BONNES.

The small village of Bonnes owes its name and origin to the mineral springs in its vicinity. Situate in the secluded valley of Ossau, in the de-

partment of the Basses Pyrenees, seven leagues from Pau, and shut in on either side by high and peaked mountains, it was, until lately, almost inaccessible for carriages, although the water has been in high repute, and in the time of Henry IV. was much employed to heal the wounds of soldiers, under the name of *eau d'arquebusade*. Good roads, however, now render the access easy ; yet Bonnes is not a desirable place for a summer residence, and is only resorted to by invalids and their friends. From its position and elevation the weather is generally cool, and liable to great transitions, which require to be guarded against by proper attention to clothing.

Four springs rise at Bonnes, — viz., the old spring, the temperature of which is 25° R.; the new spring (24°); *La Source d'Ortech*, which is somewhat cooler ; and the cold spring, *De la Montagne*. The water is clear, sparkling, soft, and unctuous to the touch ; of a slightly vinous, not unpleasant taste ; and is soon decomposed by the action of the atmosphere. M. Longchamp considers its composition to resemble that of the other Pyrennean waters, though it contains less

sulphur than those of Baréges and Cauterets; from which circumstance, and from its lower temperature, it is less energetic in its action, and is more applicable to some cases of internal disease with which the stronger waters would disagree. Invalids with pulmonary and bronchial disease are more especially recommended a course of the Eaux Bonnes. The water is chiefly used for drinking.

## EAUX CHAUDES.

These springs have their source in the same valley, and not far from the Eaux Bonnes. Although termed *chaudes*, their temperature is very little higher than those of Bonnes; they contain also a smaller proportion of sulphur; yet they are said to be very efficacious in rheumatic, paralytic, and dyspeptic cases, and are a good deal used by the people of the country, though but little frequented by strangers, as the village, which does not contain more than twelve or fourteen houses, built within the last few years, is devoid of tolerable accommodation. There are six springs,

which are termed Le Roi, L'Arressecq, Baudot, L'Esquirette, Le Trou, and Mainvielle ; this last is cold. These waters were formerly supposed to have great efficacy in cases of sterility, and were consequently termed by the Spaniards *Empregnades*.

## WARMBRUNN,

In Silesia, is placed at the foot of the Riesengebirge, about a league distant from Hirschberg ; it contains two thousand inhabitants, and can accommodate an equal number of visitors. The edifices most deserving notice are the convent ; the chateau of Count Schaffgotsch, to which is attached a garden, serving as a public promenade ; and the bathing establishments, which consist of the Gallery, a building used for assemblies and play ; the Probstei-bad, and the Gräffliche-bad, in each of which from thirty to forty persons can bathe at the same time. There are some bathing cabinets, which, however, are seldom required, as it is customary for patients to bathe together, as at some of the Swiss baths. Bathers are divided into three classes. The first class bathe earlier than the others, for which privilege each person pays two rix-dollars a week ; the second class pay less ; and the third, which consist chiefly of poor persons, pay a very trifling sum. Vapour baths are also much employed. Most visitors dine at one or other of the tables d'hôte ; the one at the Gallery is the most numerously attended. Families and invalids

may, however, be served in their own apartments.

Carriage excursions may be made in various directions in the plain ; for those in the mountains, persons who dislike walking may procure ponies, or covered litters, which are carried by porters : this is a very common mode for invalids to take exercise. The environs are beautiful ; Ermannsdorf ; Fischbach ; the old ruined castle of Kynast, situate on a mountain, at the foot of which lies the village Hermsdorf ; Stohnsdorf, whence the Prudelberg may be ascended, and its caverns and grottoes explored ; Schneekoppe, the highest mountain of the range, from the summit of which a fine and extensive prospect may be enjoyed ; the cascades of Kochel and Zacken ; the source of the Elbe and its fall,—all lie within a short distance from Warmbrunn.

The springs have been used from a very early period, but more extensively within the last two centuries. At the present day Warmbrunn is, next to Aix-la-Chapelle, the most frequented watering place in the Prussian territory : it reckoned, in the season of 1831, nearly 3000 visitors, most of whom used the waters.



An hospital, containing upwards of 150 beds, is every season filled with poor patients to whose cases these springs are considered suitable. They have a temperature of  $28^{\circ}$ — $30^{\circ}$  R., and are applicable to most of the cases which have already been enumerated, especially paralytic, gouty, and rheumatic rigidity and pains; scrofulous disease; stomach derangement with deficient biliary secretion; hemorrhoids; and chronic bronchial affections.

Dr. Bergemann's work gives the latest account of Warmbrunn, — "Warmbrunn und seine Heilquellen. Hirschberg, 1830."

*A Pint of Water from the Gräfflichebad contains, according to Tschörtner,*

			Grains.
Carbonate of Soda	-	-	5·830
Sulphate of Soda	-	-	2·829
Sulphate of Lime	-	-	0·444
Muriate of Soda	-	-	0·830
Carbonate of Magnesia		-	0·580
Silex	-	-	0·799
Earthy Matter	-	-	0·066
			<hr/>
			11·378

Sulphuretted Hydrogen Gas 8 cubic inches.

The Probsteibad contains the same elements, though in a somewhat smaller proportion.

## SCHINZNACH,

Or Hapsburg, as it is often called, is one of the most celebrated bathing places in Switzerland, and the accommodation is better than at many of the Swiss mineral springs. It is situate three leagues from Baden, at the foot of a hill, on which stand the ruins of the castle of Hapsburg, formerly belonging to the ancestors of the Emperor of Austria, and comprises, altogether, about sixteen buildings; one of these is a vast hotel, composed of two houses joined by a gallery, and containing 130 apartments. A handsome lodging and bathing house, of a circular form, has been erected within the last few years, and contains several elegant apartments and bathing cabinets, with a large saloon for dinners and public balls. A colonnade, attached to the house, enables visitors to take walking exercise in wet weather.

The ruined castle, whence an extensive view of the country may be obtained, Brugg, the convent of Königsfeld, and the castle of Wildenstein, are among the most frequented spots in the environs; a detailed account of which will be found in Ebel, and other guides to Switzerland. On

Sundays Schinznach is much resorted to by people from the country and neighbouring towns.

Invalids both drink and bathe. Drinkers assemble at the spring as early as five in the morning; those who bathe usually remain four or five hours in the water, as at some other places in Switzerland. The springs are of the saline sulphurous kind; their temperature is 63° Fahrenheit. Though less powerful than the springs which have been already described, they are applicable to the same cases, and have a high reputation in the country in cutaneous and rheumatic affections, visceral obstruction, and glandular enlargement.

The latest analysis of the water was made by Bauhof, who found in 300 ounces —

				Grains.
Gypsum	-	-	-	131
Sulphate of Soda	-	-	-	120
Muriate of Soda	-	-	-	99
Muriate of Magnesia	-	-	-	38
Sulphate of Magnesia	-	-	-	33
Sulphate of Lime	-	-	-	19
Carbonate of Magnesia	-	-	-	18
Oxide of Iron	-	-	-	3
Bitumen	-	-	-	2
				<hr/>
				463
Sulphuretted Hydrogen Gas	120	} cubic inches.		
Carbonic Acid Gas	24			
E 2				

## WEILBACH.

This village, situate in the plain between the Maine and the southern extremity of the Taunus hills, possesses in its immediate neighbourhood a cold sulphurous alkaline spring. The water is clear; of a sweetish, saline, and not unpleasant taste; and smells strongly of sulphur. Although the place is not much resorted to, the water is deemed highly efficacious, many thousand flasks being annually exported. Its use is sometimes combined with that of the saline springs in the duchy of Nassau and of Baden Baden. In chronic affections of the mucous membranes of the alimentary canal, air passages, and urinary apparatus; in asthma, accompanied with copious secretion; and hemorrhoidal tumours,—its exhibition, either alone, or combined with bathing in a saline thermal water, is often attended with the greatest advantage. It is not unfrequently mixed with wine, and drunk at dinner.

## ENGHIEN.

Enghien is a village of recent origin, near Montmorency, in the environs of Paris. Its mineral water was brought into more general notice by Louis XVIII., who derived great benefit from it. The establishment is now on a large scale, and numerous agreeable promenades have been formed in the vicinity.

The temperature of the spring is  $14^{\circ}$  R. According to Longchamp, the water contains the sulphates of lime, magnesia, and potass; muriates of potass and magnesia; hydro-sulphurets of potass and lime; carbonates of lime and magnesia; with a small proportion of silex and alumina. It is most frequently taken either pure, or mixed with asses' milk, in cases of chronic pulmonary disease, asthma, chronic eruptions, mucous discharge from the uterus or bladder, and paralysis. When used for bathing the water is heated up to the temperature required.

## NENNDORF,

A village in the electorate of Hesse,  $3\frac{1}{2}$  German miles from Hanover. Its cold sulphurous spring has been greatly used within the last few years. The electoral palace, the gallery, arcades, and the three bathing-houses, are the only buildings worthy of particular notice. The promenades are agreeable, and the environs pleasing.

The water is strongly impregnated with sulphur, and is chiefly employed for bathing, for which it requires to be warmed up to the proper temperature, as its natural temperature is below  $10^{\circ}$ . It is applicable to the same description of cases for which thermal sulphurous waters are recommended, but cannot be considered equal to them in efficacy.

## CHALYBEATE SPRINGS.

MANY springs containing iron do not belong to the division of chalybeate waters, which comprises only such as by their manifest tonic properties clearly indicate the predominance of the iron over the other mineralising ingredients. This depends not so much upon the quantity of the metal, which is generally very small, as upon the nature, proportion, and state of combination with it of the saline and gaseous elements. These are the chief circumstances modifying the action of chalybeate waters, and enabling persons to employ them with advantage who could not take the pharmaceutical preparations of iron. A course of waters of this class imparts tone to the digestive apparatus, and to the system generally, increasing the muscular power, altering the quality of the blood and of various secretions. It is especially adapted to individuals of torpid and lymphatic temperament, and weakly constitution ; to cases of general debility and muscular atony, unattended by morbid alteration of organs or of

the fluids, but frequently dependant upon chagrins or other moral causes, — upon diminution of the quantity, or deterioration of the quality, of the blood, induced by hemorrhage or long-continued discharges, or serious diseases. Chalybeates are also applicable to many cases of impaired energy of the assimilative functions; of hypochondriasis and other disorders of the nervous system; of passive hemorrhage, and catarrhal affections. They are also frequently used as an after-cure, subsequent to the employment of other mineral springs.

It is well known, however, that in many cases of debility, though apparently arising from no local disease, the exhibition of tonic remedies, even of the lighter kind, is not well borne, in consequence of the extreme susceptibility of the nervous system to impressions of any kind. In other cases the debility, though the most apparent, is not the only cause of impaired health, but is complicated with latent alterations in the state of particular organs or secretions, which prevent the beneficial action of this class of remedies, and which require for their removal



deobstruents, or alteratives: in some instances medicines of this kind may even be advantageously combined with the use of chalybeates.

On the other hand, tonics and chalybeates are prejudicial in persons of full habit of body, of rigid fibre, with tendency to visceral congestion, active hemorrhage, and diseases of an inflammatory nature; in cases of organic change of important internal parts, of dropsy, and pregnancy. When they agree they are easily digested, produce a feeling of invigoration, improved appetite and strength, without inducing constipation of the bowels, or symptoms of congestion towards the head or chest.

## PYRMONT.

Few watering-places have enjoyed such a high degree of celebrity, or have been more universally resorted to, than Pyrmont, which is situate eight German miles from Hanover, in a delightful valley enclosed by well-wooded hills, and contains about 2000 inhabitants. The lodging-houses, of which the Logirhaus is the principal, are commodious, and the accommodation is of the best kind: music, concerts, balls, the theatre, and play, are the public amusements during the season; there is also a good library and reading-room. The most usual promenade, where a musical band is in attendance during the greater part of the day, is a fine alley of double rows of lime trees, beneath which are numerous booths for the sale of fancy articles. This avenue leads to the drinking spring, which is contained in a handsome octagonal building, surmounted by a cupola. A second long avenue, terminating in a circle of trees, in the centre of which stands a colossal statue of Esculapius, is chiefly resorted to by equestrians.

The environs of Pyrmont are extremely beautiful. Excursions are most frequently made to the ruins of Schell-Pyrmont on the Schellenberg, Holzhausen, the convent of Luegde, Hünenberg, Königsberg, Scheider, the Mount Oher, and the Dunsthöhle,—a cavern whence carbonic acid gas is emitted, as at the Grotto del Cane, near Naples.

Pyrmont possesses three kinds of mineral springs—chalybeate, saline, and acidulous; but is chiefly frequented on account of the chalybeate ones, especially the Trinkquelle, of which upwards of an hundred thousand flasks are exported annually. The water is exceedingly rich in iron and carbonic acid gas, is limpid, very sparkling, of an agreeably acid and somewhat astringent taste, and on standing deposits a brownish sediment composed of oxide of iron and maganese; its temperature is 10° R. A few glasses taken in quick succession occasion a sort of temporary intoxication, with a feeling of satisfaction and hilarity. When a certain quantity is drunk it has an aperient effect, and promotes the excretion of urine. It is better supported than most waters of this class; and when it can be procured, merits

a decided preference over others, especially in cases of general debility remaining after loss of blood, copious discharges, parturition, or severe illness; in chlorosis, hypochondriasis, hysterical and other nervous affections; diseases of the digestive and urinary apparatus, depending on general or local debility; passive uterine and hemorrhoidal hemorrhage; suppressed or difficult menstruation; leucorrhea, and sterility from weakness, especially where the generative organs had not acquired their full development previous to marriage.

The bathing springs—Neubrunnen and Augenbrunnen or Eye Spring—closely resemble the Trinkquelle in their composition, but are less rich in solid and gaseous parts: the temperature of the latter is lower than that of the others, being only 8°. As its name implies, it is considered serviceable in some diseases of the eyes, especially in those of a strumous nature, debility of the lachrymal apparatus, and some forms of amaurosis: it is also taken internally. In the form of bath the water has a stimulating and tonic action on the skin, improving its functions, exciting the activity of the

absorbent system, and thereby causing the dispersion of scrofulous swellings, and the healing of old ulcers. It is also very useful in this form, in some nervous diseases, atonic gout and rheumatism, chronic mucous discharge, and tendency to miscarriage, when its employment is not counter indicated by any of the states of the system above mentioned.

The saline and acidulous springs remain to be considered, and will be noticed when treating of these classes.

More detailed information will be found in the works of two of the resident physicians: "Steinartz, "Pyrmont und seine Mineralquellen" — "Harnier, Résumé d'Analyse et d'Expérience sur la Nature et l'Usage des Eaux de Pyrmont. Hanovre."

*Sixteen Ounces of Water from the Trinkquelle contain, according to Brandes and Krüger,*

			Grains.
Carbonate of Soda	-	-	4·0235
Sulphate of Soda	-	-	1·5586
Sulphate of Magnesia	-	-	3·1628
Carbonate of Iron	-	-	0·7389
Muriate of Magnesia	-	-	0·4276
Muriate of Soda	-	-	0·4046
Phosphate of Soda	-	-	0·0657

			Grains.
Phosphate of Potass	-	-	0.1012
Sulphate of Lithion	-	-	0.0030
Sulphate of Lime	-	-	6.0320
Carbonate of Lime	-	-	5.8733
Carbonate of Manganese	-	-	0.0200
Sulphate of Strontian	-	-	0.0217
Sulphate of Barytes	-	-	0.0015
Silex	-	-	0.0954
Earthy Matter	-	-	0.1133
			<hr/>
			22.8364

Carbonic Acid Gas 44.92 cubic inches.

#### SPA.

Since the division of the kingdom of the Netherlands, Spa has been comparatively deserted. It is out of favour with the English, and also with the Dutch, who formed a large proportion of its visitors previous to the revolution; yet its mineral springs are among the most efficacious of their class, and second only to those of Pyrmont. Every convenience is offered for the accommodation of its guests; more than the ordinary public amusements of watering places are met with, the promenades are numerous and pleasantly laid out, the environs agreeable. It lies in a valley of the Ardennes, a few miles off the road, between Aix-

la-Chapelle and Liege, and is about six German miles distant from each of these towns.

The Pouhon or principal spring is the only one which rises in the town: its temperature is 8° R. A large quantity of the water is annually exported to different parts of Europe. The other springs are—the Géronstère, which is next in celebrity, and rises in a wood a mile and a half distant from Spa; its temperature is lower than that of the Pouhon, being only 7°. The Sauvenière and the Groesbeck are near the former. The two Tonnelets, which also rise at some distance from the town, contain but a very small quantity of iron, and have been classed by some among the acidulous springs: they are much used for baths.

When fresh drawn, the water is exceedingly clear and sparkling, of an agreeably sharp ferruginous taste; on exposure to the air it soon becomes turbid, and deposits an ochrey sediment. It may be prescribed in the same cases as the water of Pyrmont. As however it contains much less carbonic acid gas than the Pyrmont water, its action is less exciting, and can often be better borne, particularly in states of debility and morbid sensibility of

the stomach and bowels, with diarrhoea or increased secretion from the mucous membrane; in cases of mucous or passive sanguineous uterine discharge, its operation is highly beneficial, where these conditions are not kept up by the existence of organic disease; in chlorosis and some nervous affections its administration is mostly attended with great benefit.

*Sixteen Ounces of Water from the Pouhon, analyzed by Struve, yielded*

			Grains.
Sulphate of Potass	-	-	0·0799
Sulphate of Soda	-	-	0·0357
Muriate of Soda	-	-	0·4494
Carbonate of Soda	-	-	0·7357
Silex	-	-	0·4985
Phosphate of Alumina	-	-	0·0085
Phosphate of Lime	-	-	0·0136
Carbonate of Lime	-	-	0·0955
Carbonate of Magnesia	-	-	1·1228
Carbonate of Iron	-	-	0·3751
Carbonate of Manganese	-	-	0·0519
			<hr/> 4·3393

Carbonic Acid Gas 8·19 cubic inches.

On comparing this analysis with the preceding, the great difference in the quantity of solid and



gaseous substance yielded by the Trinkquelle and the Pouhon will be seen, and the more powerful action of the former may be estimated. Monheim found, however, that the solid substance contained in a pint of the Pouhon water amounted only to 3·3750 grains; but, on the other hand, that the quantity of gas was 21·68 cubic inches, being about half the quantity contained in the Pyrmont spring. — See Dr. Monheim's Work, "Die Heilquellen von Aachen, Burtscheid, Spaa, Malmedy und Heilstein. Aachen und Leipsic, 1829." Or its translation.

## MALMEDY

Is a town in Rhenish Prussia, situate between Spa and Coblenz, and possessing in its immediate vicinity several ferruginous springs, of which the principal have the Walloon appellation Pouhon. Thus there are the Pouhon de Gérémont, the Pouhon des Isles, and the Ponhon de Laveaux. These springs resemble one another in their chemical composition, and may be ranked among the most powerful of this class in Germany. Though holding in solution more iron and saline

substance than the springs of Spa, they are in general as easily supported by weak stomachs, and are applicable to most cases in which chalybeate waters are recommended. Malmedy, however, does not offer the same *agrémens* for a residence as Spa or Pyrmont. According to Monheim a pint of the water contains 10 grains of solid substance, and 13 cubic inches of carbonic acid gas.

#### SCHWALBACH,

Or Langen-Schwalbach, as it is frequently termed, is a small quiet town of the duchy of Nassau, situate two German miles from Wisbaden and six from Ems, in a narrow valley enclosed between steep hills almost denuded of wood, and has rather a cheerless aspect. Its tranquillity would suit those who prefer seclusion to the bustle of more frequented watering places. Persons, however, who use chalybeate waters generally require at the same time amusement, for which Schwalbach offers few resources. In the environs are some pretty spots; but there is a want of shady walks in and about the town, which is a great disad-

vantage, as the heat must be excessive in July and August, the period when Schwalbach is most frequented.

Till within the last few years the water was but little used externally; bathing has, however, become more general since the completion of the handsome bathing-house and promenade room, erected by the duke. The bathing cabinets are conveniently fitted up, and are divided into three compartments, one for each of the principal springs,—the Stahlbrunnen, the Weinbrunnen, and the Pauline. The water is heated up to the temperature required for bathing. The hotels have no baths, but the accommodation is good; the principal one contains a large saloon for diners, public balls, and roulette. In the season of 1833 the number of visitors amounted to 1400; many of these, however, made but a very short stay.

The mineral water of Schwalbach is remarkable for the large quantity of gas which it contains compared with its solid constituents; in this respect it resembles that of Spa. The Stahlbrunnen is less gaseous than the Weinbrunnen and the

Pauline; which last is lighter, and often well borne when the others disagree. The water seen at the springs bubbles, sparkles, and is of a brownish colour; but when a small quantity is taken into a glass it is colourless and transparent. It has a temperature of 9° R., and tastes exceedingly cold and metallic; but after having drunk one feels invigorated and refreshed. Many thousand flasks are annually exported. A course of Schwalbach water is mostly serviceable in the cases which have been already mentioned in the general remarks on Chalybeate Springs, and under the head of Pyrmont. It is frequently advised after the use of the Ems or Wisbaden waters. The season begins about the middle of June, and terminates towards the end of August.

Sixteen ounces of water contain —

*Stahlbrunnen, analysed by Gärtner,*

			Grains.
Muriate of Soda	-	-	0·166
Carbonate of Soda		-	0·138
Sulphate of Lime	-	-	0·444
Carbonate of Lime			0·913
Carbonate of Magnesia		-	0·555
Oxide of Iron	-	-	0·552
			<hr/>
			2·768

Carbonic Acid Gas 16·050 cubic inches.

*Weinbrunnen, analysed by Rube.*

			Grains.
Muriate of Soda	-	-	0·25225
Carbonate of Soda	-	-	0·50000
Sulphate of Soda	-	-	0·37837
Carbonate of Lime	-	-	1·63649
Muriate of Magnesia	-	-	0·20270
Carbonate of Magnesia	-	-	4·24324
Sulphate of Lime	-	-	0·48648
Earthy Matter	-	-	0·32432
Oxide of Iron	-	-	0·66351
			<hr/>
			8·68736

Carbonic Acid Gas 22 cubic inches.

## KISSINGEN.

Kissingen is a small town in the Bavarian territory, of about a thousand inhabitants, situate in a picturesque valley, three miles from Bruckenau, and one from Bocklet. It has been frequented nearly three centuries: the yearly number of visitors has been, within the last few years, upwards of a thousand. The accommodation is good, the environs are agreeable, and the usual resources for amusement are not wanting.

There are three springs, the Ragozzibrunnen, the Pandur, and the Maxbrunnen; the two for-

mer are chalybeate, the latter is acidulous. The Ragozzibrunnen is mostly used for drinking. The water is annually exported in large quantity; it is not very clear; the colour is yellowish; its taste saline and ferruginous. The astringent property of the iron is in great measure neutralised by the quantity of salts which it contains; its operation is consequently laxative; and at the same time tonic. The Paudur water greatly resembles the former in its properties, and is chiefly used for baths. Temperature 9°. The action of these springs upon the mucous membranes, the absorbent and nervous systems, renders them peculiarly applicable to cases where it is desirable to produce a tonic, but not astringent, effect, as in diseases of the chylopoietic viscera dependent upon want of tone; hypochondriasis and hemorrhoids, with tendency to constipation; chronic affections of the mucous membrane of the air passages, or of the urinary organs, when without inflammatory complication; leucorrhea and irregular menstruation arising from general or local debility; scrofulous cases; many nervous complaints, and other cases to which the exhibition of tonics is suited. The baths are

said to be very efficacious in cases of atonic gout and rheumatism.

In the season of 1833 the number of visitors, among whom were many distinguished persons, amounted to 1400.

*A Pint of Water from the Ragozzibrunnen, analysed by  
Kastner, yielded*

			Grains.
Muriate of Soda	-	-	62·05
Muriate of Magnesia	-	-	6·85
Muriate of Potass	-	-	0·91
Carbonate of Lime	-	-	3·55
Carbonate of Soda	-	-	0·82
Carbonate of Magnesia	-	-	2·50
Sulphate of Soda	-	-	2·00
Sulphate of Lime	-	-	2·50
Silex	-	-	2·55
Iron	-	-	0·63
Carbonic Acid Gas	-	-	26·25 cubic inches.

With minute proportions of Phosphate of Soda, Earthy and Animal Matter; and traces of Iodine, Manganese, and Lithion.

## MARIENBAD.

This bathing-place, which has been so much frequented of late years, lies about five German miles from Carlsbad, and three from Eger, in a valley surrounded by high mountains, presenting,

in its natural state, a cheerless and unattractive appearance; within the last twelve years, however, the place has been greatly embellished by the planting of trees, the formation of gardens and pleasure grounds à l'Anglaise. At present Marienbad consists of about a hundred houses, many of them handsome, and offers numerous *agrémens* to those who are induced to make it a summer residence. Nor are the environs wanting in interest; Amalienshöhe, Auschowitz, Hohendorf, the convent of Tepel, the castle of Königswarth, &c., lie within an easy drive, and are among the spots most frequently visited.

Marienbad has the advantage of possessing two kinds of mineral springs, belonging to the saline-alkaline and the alkaline-chalybeate classes; of the first are the Kreutzbrunnen and the Ferdinandsbrunnen, which are the most used: they also contain iron, though in small quantity, and will be considered under the head of saline springs. The Carolinenbrunnen, Marienbrunnen, and Ambrosiusbrunnen may be ranked among the chalybeate waters.

The Carolinenbrunnen is chiefly used for drink-



ing ; the water is clear, sparkling, of a saline ferruginous, not disagreeable, taste ; its temperature is 7° R. It is richer than the other springs in carbonic acid gas, which is intimately combined with the iron ; it is consequently easily borne, even by persons whose digestive powers are weakened. The Ambrosiusbrunnen resembles the former, but is less rich in solid and gaseous parts. The Marienbrunnen contains a very small proportion of solid substance, and is principally used for baths. The action of these springs is exciting and strengthening, without being astringent. A course of the water may, therefore, be recommended in some cases where the more pure chalybeate springs would be inadmissible. It is more particularly advisable in many nervous affections, chronic pulmonary catarrh, chlorosis, debility of the digestive powers, sanguineous or mucous discharges of a passive nature, and scrofulous diseases. Water and mud baths and douches are much employed in atonic gout, rheumatism and paralysis, ulcers, scrofulous tumours, and some cutaneous affections ; local gas baths are likewise employed in cases of atony of particular

parts. The use of the chalybeate is not unfrequently joined with that of the saline springs.

The following table will exhibit the relative proportions of mineralising substance in the three springs : —

*Water, Sixteen Ounces.*

	Carolienbrunnen. Reuss & Steinmann.	Ambrosius- brunnen. Reuss.	Marien- brunnen. Reuss.
Sulphate of Soda	- 2·793	1·866	0·3534
Muriate of Soda	- 0·820	1·640	0·0473
Carbonate of Soda	- 2·201	1·668	
Carbonate of Lime	- 3·665	2·849	0·4362
Carbonate of Magnesia	3·949	2·729	0·0606
Carbonate of Iron	- 0·445	0·341	0·0348
Silex	- 0·462	0·486	0·1898
Extractive	- 0·386		
	<hr/> 14·721	<hr/> 10·624	<hr/> 1·1952 grains.
Carbonic Acid Gas	- 15·436	12 928	9·0560 cub. in.

FRANZENSBRUNN,

Or Franzbad, consists of from sixty to eighty houses, situate in an open agreeable country, a league distant from Eger, and six from Marienbad. The water of the principal spring, known by the name of Eger water, has been long used in the

country, and exported to distant parts. It is only, however, within the last twenty years that Franzbad has been much resorted to by invalids, and every year the number of its visitors is increased. Colonnades lined with shops, porticoes at the fountains, avenues of trees, pleasure grounds laid out with taste, and numerous spacious lodging-houses have arisen, and already give Franzbad the appearance of a well-frequented watering place. A large saloon, at the principal restaurant is the point of reunion for dinners and public balls. The bathing-house contains thirty-six cabinets, douches, and also mud baths, which are a good deal employed.

The Franzquelle and the Louisenquelle are alkaline-saline chalybeate springs; the cold Sprudel, an acidulous chalybeate; the Salzquelle, a saline spring. The water of the Franzquelle has long enjoyed high reputation; it is clear, sparkling, of a saline-astringent taste, and is mostly for internal use, while the Louisenquelle is principally used for bathing; its sediment is employed as a local application, or mixed with water, as a

mud bath. The cold Sprudel is used both for drinking and bathing ; temperature of the Franzquelle  $9\cdot33^{\circ}$  R.

The water of these springs is in general well supported, as the quantity of aperient salt neutralises the astringent effect of the iron ; it excites and gives tone to the alimentary canal, improving the appetite and digestion ; diminishes irritability of the nervous system ; and when not aperient, generally increases the renal secretion. It is used with great advantage in nervous diseases with the character of atony or of irritability, hysterical pains, chlorosis, gouty and hemorrhoidal affections in weak persons, menorrhagia, leucorrhea, asthma and chronic catarrh with copious secretion, scorbutic diseases, sterility when dependent upon local or general debility, atony of the digestive organs, hypochondriasis with deficient biliary secretion, tendency to miscarriage, catarrhus vesicæ, and gravel. Most patients drink and bathe.

*Sixteen Ounces of Water of the Franzquelle contain, according to Tromsdorf,*

	Grains.
Muriate of Soda - - -	8·9333
Sulphate of Soda - - -	25·4166
Subcarbonate of Soda - -	8·4566
Carbonate of Lime - - -	1·6000
Carbonate of Magnesia - -	0·5333
Carbonate of Lithion - -	0 0026
Carbonate of Strontian - -	0·0013
Iron - - - - -	0·0680
Manganese - - - - -	0·0040
Phosphate of Lime - - -	0·0213
Phosphate of Magnesia - -	0·0106
Silex - - - - -	0·3666
	<hr/> 45·4142

Carbonic Acid Gas 21·106 cubic inches.

## LIEBENSTEIN.

This village is situated in the duchy of Saxe-Meiningen, four German miles north of Meiningen, in a fertile romantic country, bordering on the forest of Thuringia. The accommodations are good, and, with the arrangement of the baths, are under the superintendence of the government. Living is cheap, as at most of the German baths.

The Fürstenhaus contains a saloon for public entertainments, and gaming rooms ; a theatre is also open in the season. Among the spots best worth notice in the environs may be mentioned the cavern near Glücksbrunnen, the castle of Altenstein, the park, a grotto termed the Hollow Stone, the mountains Aschelberg and Inselberg.

The springs of Liebenstein are among the strongest chalybeate springs of Germany ; their water is heating, exciting, and astringent ; they are consequently better adapted to individuals of an indolent or phlegmatic temperament, than to those of a nervous irritable habit, and are more used for bathing than for drinking. A course of the water will be serviceable in most cases where the stronger chalybeates are indicated, particularly debility of the digestive powers without tendency to constipation, some cases of hypochondriasis, chronic catarrh with copious expectoration, scrofulous and nervous affections in persons of a torpid habit. The temperature of the water is 49° Fahrenheit.

*A Pint contains, according to Tromsdorf,*

			Grains.
Sulphate of Soda	-	-	- 1'600
Muriate of Soda		-	- 2'300
Sulphate of Lime	-	-	- 0'500
Muriate of Lime	-	-	- 1'111
Carbonate of Lime	-		- 3'923
Muriate of Magnesia		-	- 3'050
Carbonate of Iron	-	-	- 2'000
			<hr/> 14'482

Carbonic Acid Gas 26 cubic inches.

#### DRIBURG,

A small town of 1500 inhabitants, not far from Pyrmont, placed at the foot of a mountain, on which stands the ruined castle of Ibourg. Though not greatly resorted to, Driburg does not lack *agrémens* for a short residence. The accommodation is good, the country pretty: it has its musical band, public ball-room, and gaming tables, like more celebrated watering places; and its springs are in great repute, a large quantity of the water being annually exported.

There are nine springs: the principal are the Hauptrinkbrunnen, or drinking spring, and the

Louisenbrunnen. They are rich in saline substances, iron, and carbonic acid gas, and in their action are not unlike the Pyrmont water. Patients drink, bathe, and use the sediment as a local application.

*Sixteen Ounces of the Water, analysed by Du Menil, yielded*

	Grains.
Muriate of Soda - - -	6.535
Sulphate of Magnesia - -	7.217
Sulphate of Lime - - -	10.937
Carbonate of Lime - - -	7.720
Carbonate of Magnesia - -	0.099
Carbonate of Iron - - -	0.688
Muriate of Lime - - -	8.283
Muriate of Magnesia - - -	0.574
Silex - - -	0.062
Vegetable and Earthy Matter -	0.028
	<hr/> 34.143

Carbonic Acid Gas 34.99 cubic inches.

#### BOCKLET,

A village in Bavaria, situate a mile and half from Kissingen, and two miles from Bruckenuau: it is a good deal frequented in the season, though the accommodation is but indifferent, and articles of luxury are not easily procured. The springs,



which are four in number, belong to the saline chalybeate division. They are termed the Ludwigsquelle, the Friedrichsquelle, the Carlsquelle, and the Schwefelquelle or sulphur spring; this last, however, contains but a very minute proportion of sulphuretted hydrogen gas, and differs from the others in the smaller amount of saline substance, which consists principally of muriate and sulphate of soda, muriate of potass and magnesia, carbonate of lime and magnesia.

The water is strongly ferruginous, and contains a large proportion of carbonic acid gas. A good deal of it is sent to Kissingen, Bruckenuau, and other places within the kingdom. Its action is powerfully tonic and exciting; it is, consequently, inadmissible in cases with tendency to plethora, or in those attended with high nervous irritability, but is better adapted to those conditions of the system in which the water of Liebenstein has been recommended. The Schwefelquelle is much used in derangement of the digestive functions, rheumatic pains, and obstinate eruptions.

## BRUCKENAU.

This small town is placed in an extremely picturesque country; the baths are about a league distant, in a pretty valley watered by the little river Sinn. The chief buildings are the Furstenhaus; the Gasthaus; the Red House, with a public saloon and eighty apartments; the Kurhaus, and three lodging-houses near the springs. The environs are agreeable and park-like, abounding in well-shaded walks. One of the spots most frequently visited is the Franciscan convent on the Kreutzberge, which commands a beautiful and extensive prospect. Bruckenau is a good deal frequented in the season, chiefly by Bavarians, and is a favourite summer residence of the present King.

There are three springs; the Bruckenau, the Wernaiz, and the Sinnberg. The first is a pure chalybeate spring, used for drinking and bathing in the same kind of cases to which the water of Liebenstein or Bocklet is applicable. Some thousand flasks of it are annually exported. The two

others contain but a small proportion of iron, and may rank with the saline springs: they are frequently employed preparatory to a course of the Bruckenau spring.

The season begins about the middle of June.

*Analysis of the Bruckenau Spring according to Lieblein.*

*Water Sixteen Ounces.*

			Grains.
Muriate of Soda	-	-	- 0·55
Carbonate of Soda	-	-	- 1·33
Sulphate of Lime	-	-	- 1·03
Sulphate of Magnesia	-	-	- 1·55
Oxide of Iron	-	-	- 2·29
			<hr/> 6·75

Carbonic Acid Gas 6·5 cubic inches.

#### EILSEN.

Eilsen lies about six German miles from Hanover and two from Minden, at the foot of the Harrelberg. The environs are agreeable, and possess many objects of interest; among which may be enumerated the old castle of Arensbourg, the rock of Luhden, the waterfall near Langenfeld, the lake of Steinhöde, with the fortrees of

Wilhelmstein on an island. From the summit of the Harrelberg a fine and extensive prospect of the country may be obtained. The public amusements are concerts and balls; gaming is prohibited: few persons, however, visit Eilsen for purposes of pleasure. The number of those who use the waters amounts to about 1000 annually.

Eilsen possesses eleven springs, of which seven are sulphureous and four chalybeate. The most celebrated are the Georgenbrunnen, the Julianenbrunnen, the Augenbrunnen, and the Wiesenquelle. The sulphureous springs are used for drinking and bathing in those cases to which this class is more especially applicable. The chalybeate water may be used in most of the complaints for which tonics are indicated: it is not unfrequently given after a course of the sulphureous water. Mud baths, which were originally used at Eilsen, and have since been employed at several German springs, are still much employed in paralysis; obstinate gouty, rheumatic, and cutaneous affections; indurations; and contractions of the joints.

For further information see the work of Holz-

enthal,—“Eilsen und seine Umgebungen. Minden, 1831.”

## RIPPOLDSAU

Consists of about twenty houses, situate in a wild romantic valley in the duchy of Baden, two German miles from Griesbach. There are four springs, which are rich in carbonic acid gas and saline substance, principally sulphate of soda and carbonate of lime: the quantity of iron is very small, yet the water is tonic, and at the same time aperient, or diuretic. It often agrees well with those who would be unable to take the more pure chalybeate waters. The place itself is not much frequented by foreigners; but the water is exported in large quantity, and is often used at Baden Baden, in conjunction with the baths. Griesbach likewise possesses chalybeate springs, and is resorted to by persons resident in the duchy.

## FORGES.

This village, in the department of the Seine inférieure, nine leagues from Rouen, possesses some of the most celebrated chalybeate springs in France; which, however, contains but few of this class, compared to the number of sulphureous and saline springs. Next to the chalybeate springs of Forges, those of Busang in the Vosges, Cransac, Provins, the warm springs of Rennes les Bains, and the water of Passy, are the most used in France.

Forges is a good deal frequented in the season, which is but short, beginning in July and terminating at the end of August. There are three springs; La Reinette, La Source Royale, and La Source du Cardinal. The two last are so called from their having been employed by Louis XIII. and Richelieu. They contain but a small quantity of carbonic acid gas and iron: their temperature is 7° R. Like the other cold chalybeate waters, this is sent in large quantity to the capital, and to different parts of the kingdom. Its

exhibition is useful in cases where the lighter chalybeate waters are indicated.

#### BUSANG.

Busang lies ten leagues from Plombières. Its mineral water is frequently used by invalids at that watering place, and is exported to various parts of France. It is not unpleasant to the taste; and contains a large proportion of free carbonic acid, which renders it, when mixed with wine, an agreeable beverage at dinner. The salt, which predominates, is the carbonate of soda; the iron is in small quantity. The water of Busang may be used in the same cases as that of Forges, but has no peculiar efficacy to entitle it to preference over other springs of the same class.

#### PASSY,

Close to Paris, possesses three chalybeate springs, which are much employed by the inhabitants of the metropolis. The principal ingredients which enter into their composition are, sulphate of iron, lime,

and magnesia; muriate of soda; carbonate of iron, and carbonic acid gas. The proportion of iron is small, and the water is inferior in point of efficacy to most chalybeate springs. It may be useful in cases of dyspepsia without inflammatory complication, hypochondriasis, chlorosis, passive hemorrhage, and other cases where strong tonics are not required.



## SALINE THERMAL SPRINGS.

MURIATE of soda, or common table salt, is the ingredient found in greatest abundance in waters of this class, and is generally combined with earthy or alkaline sulphates, carbonates, and muriates, small quantities of metal and animal substance, and very variable proportions of carbonic acid gas. The operation of these springs is alterative, and necessarily depends upon the relative proportion and state of combination of the integral parts, the temperature, the condition of individuals, &c.; but in general, when taken internally, the water increases the secretions of the alimentary canal without proving purgative, of the kidneys, and of the skin, though often in a manner scarcely perceptible. Used in the form of a bath, it excites the nervous and vascular systems, augments the activity of the cutaneous circulation and of the absorbents; and thus often tends materially to relieve states of visceral congestion, to diminish glandular swellings, and to improve disordered states of the mucous mem-

branes, skin, and fibrous structures. Its employment requires professional superintendence, and is contraindicated in most of the cases in which sulphureous waters are inadmissible.

## WISBADEN,

The capital of the Duchy of Nassau, is about an hour's drive from Mayence, and three from Frankfort. It lies in a valley, encircled by low hills ; behind which, on the north and north-west, rises the range of the Taunus mountains, whose dark foliage forms an agreeable contrast to the brighter green of the meadows and the white buildings of the town. Within the last few years several new streets have been erected: the Wilhelmstrasse, fronting the promenades, would bear a comparison with some of the finest streets in Europe; it consists principally of lodging-houses elegantly fitted up. The Kurhaus der Vier Jahrzeiten, or principal hotel and bathing-house, forms one corner of this street and one side of a square; on the opposite side of which stands the handsome new theatre, where the Mayence company performs during the season. Across the road lies a verdant meadow, bordered by avenues of limes and chestnut trees; beyond which are colonnades

for shops, and the Kursaal, which contains a handsome saloon for dinners on fête days and public balls, with smaller rooms for refreshment and games of hazard. The ground behind this building and the colonnades is laid out as a public garden, adorned with shrubs and parterres of roses, and shaded by acacias and other trees, the resort of numerous singing birds. From this pleasure ground an agreeable path is continued by the side of a streamlet up the valley of Sonnenberg, beyond the ruins of the ancient castle.

Nothing has been neglected to render Wisbaden the most frequented watering-place in Germany ; the walks and drives are pleasing ; and from the rising grounds the Rhine, with Mayence and other towns on its banks, are seen. A hunting-box of the Duke's stands in a conspicuous position, on an elevated ridge of the Taunus, and commands a fine prospect over an extensive tract of variegated country, including the richest part of the Rhingau. At Biberich on the river, four English miles from Wisbaden, the Duke has a château where he usually resides ; the garden is

tastily laid out à l'Anglaise, and admission is granted to strangers.

The population of Wisbaden amounts to about 8000 persons, mostly protestants, consisting of the military, government employés, tradespeople, and others connected with the bathing establishments. The people throughout the duchy appear to be industrious and contented. Sunday is with them a gala day: the shops at Wisbaden continue open, as also the theatre and ball-room, which are filled with visitors from Frankfort, Mayence, and other parts in the neighbourhood. On these occasions some hundreds of persons dine at the tables d'hôte of the Kursaal, the Vier Jahrzeiten, and the Adler. Most of the English visitors remaining at Wisbaden and other watering places on the Continent dine at the tables d'hôte, private dinners being frequently composed of dishes warmed up a second time.

The springs of Wisbaden were used in the time of the Romans, and have always enjoyed a high reputation. Within the last few years the place has been greatly frequented by the English, to

whom it presents many advantages, in the superiority of its accommodations, its delightful environs, and its comparatively short distance from England, which may be reached in four days by descending the Rhine. The efficacy of the waters, which are among the most powerful of their class, is a great inducement for invalids to prefer it to other Continental watering places; in some cases, however, their action is too exciting, and others less powerful, as Baden-Baden, are found to agree better.

The Kochbrunnen, or boiling spring, is the most generally used; it rises in the town, and is the central point where a crowd of persons of various nations assemble at stated hours to sip their glasses of water, while sauntering about under the acacia avenues, and listening to the musical band. The water is perfectly limpid when taken into a glass; its taste is rather agreeable than otherwise, and has been compared to that of weak broth oversalted; its temperature is 151° Fahrenheit. The carbonic acid gas is seen bubbling up to the surface of the water; the

quantity contained in a pint amounts, according to Ritter, to  $6\frac{5}{4}$  cubic inches. This spring holds in solution a greater quantity of saline substance than any other of the same class; those of Pyrmont and Borcette, perhaps, excepted. The Kochbrunnen supplies the public baths and the hospital, which are close to it, the hotel of the Vier Jahrzeiten, and some bathing-houses. The temperature of the spring at the Adler, and of the others, is somewhat lower than that of the Kochbrunnen; there is, however, no very material difference with respect to their chemical composition.

Used in the form of bath, the water is generally exciting; it stimulates powerfully the skin and absorbent system, not unfrequently producing an eruption on the surface, whence the excitment is transmitted to internal parts, especially the abdominal viscera, increasing the activity of their functions, though in many cases no perceptible change is experienced at the time. Internally taken it promotes digestion, sometimes producing an aperient effect; frequently increases the secretion of the kidneys, and acts consecutively upon

the skin. Most invalids combine the internal with the external use of the water.

A course of this water is specially applicable to cases of articular rheumatism, with swellings of the joints of long duration; chronic gout, particularly when accompanied with calcareous deposits; disorder of the digestive powers, with vitiated secretion; strumous enlargement of the glands, or disease of bones; derangement of the general health in persons who have long resided in tropical climates, as well as that caused by intemperance, or the abuse of mercury, when not attended by exceeding debility; some cases of neuralgia and tic; amenorrhea, and dysmenorrhea, if unaccompanied with a high degree of local irritation; paralytic affections, especially if caused by morbid impressions upon the organic nervous system, and not depending upon cerebral disease; and some chronic diseases of the skin. It is also said to be efficacious in bronchial complaints and asthma with copious expectoration; in these cases the inhalation of the vapour is joined to the employment of the water. Douches, local and general vapour baths, are used in many cases of local disease, as is



also occasionally the muddy sediment deposited from the water.

*Solid Substance yielded by a Pint of Water from the Kochbrunnen, analysed by Kastner.*

			Grains.
Muriate of Soda	-	-	- 44·225
Sulphate of Soda	-	-	- 0·700
Muriate of Lime	-	-	- 5·480
Sulphate of Lime	-	-	- 0·420
Carbonate of Lime	-	-	- 1·650
Muriate of Magnesia	-	-	- 0·790
Carbonate of Magnesia		-	- 0·700
Extractive Matter	-	-	- 1·750
Iron	-	-	- 0·078
Muriate of Potass	-	-	- 1·200
Fluate of Magnesia		-	- 1·600
			<hr/> 57·593 <hr/>

## BADEN-BADEN.

This much frequented place, termed by the Romans Civitas Aquensis, is situate about a league from the high road to Basle and Frankfort, in a pleasant valley disposed in meadows, corn-fields, and orchards, enclosed by lofty hills clothed to their summits with beech, oak, and pine; the little river Oos flows through the valley; the roads

are lined with apple, pear, and walnut trees; and on the lower eminences the vine is cultivated. The town, partly built on an acclivity, and overlooked by the château, has a cheerful appearance, and contains about 4000 inhabitants, mostly catholics. An equal number of strangers can be lodged in the season; many new houses having been built, and the accommodation much improved within the last few years. In the saloon of the principal hotel, the Badische Hof, upwards of 150 persons sit down daily in the season to the table d'hôte; during dinner a musical band is in attendance, as is the custom at most of the German baths. The "Conversations-haus," an establishment for restauration, play, and public balls, stands in the pleasure ground, which is agreeably laid out, and is well sheltered by acacias and chesnut trees, beneath which booths are erected for the sale of books, trinkets, &c.

As only one good carriage road passes through the valley, excursions are usually made on foot or on donkeys. A fine oak avenue, leading to the convent of Lichtenthal, is the most frequented promenade. A chalybeate spring was discovered

at Lichtenthal a few years ago, and a bathing-house is now built for its use. Many delightful paths have been made among the hills and valleys. One of the pleasantest leads to the extensive ruins of the old castle, which is a prominent feature in the view from Baden, and whence the eye ranges over a fine prospect of the pine-covered hills of the Black Forest on the one side, and on the other of the valley and plains extending to the Rhine, beyond which towers the lofty and elegant spire of Strasburg cathedral.

The season begins in June and terminates in September, during which period Baden is thronged with visitors from most countries of Europe in pursuit of health or amusement, and in few places could two or three months be more agreeably passed. The springs rise within a short distance from each other: their temperature varies from 44° to 54°; their constituent parts are the same in all. The Ursprung is the hottest and most used; the taste of the water is not unlike that of the Kochbrunnen. Near the spring are public baths, which, as well as the bathing-houses, are provided with the requisite apparatus for douches

and vapour baths. The vapour douche is also used in some cases; by this means a stream of vapour can be directed against any particular part without coming in contact with other parts of the body. It is principally applicable to cases of long-standing muscular rigidity; contractions of the limbs; chronic pains, swellings; and some varieties of atony of the organs of sense, particularly deafness. The vapour is likewise inhaled with great benefit in many cases of chronic asthma, pulmonary and bronchial disease.

Many patients both drink and bathe; others either drink or bathe, according to circumstances; and some are recommended while under a course of baths to drink the Carlsbad water, or a light chalybeate which is manufactured at Baden-Baden.

Used in the form of bath the action of the water, though less exciting to the skin, is not unlike that of Wisbaden; it does not so frequently occasion perspiration and eruption. When the temperature of the bath is not higher than 94° or 96° Fahrenheit, it has a sedative effect on the nervous system, the pulse becoming slower, and a

tendency to sleep succeeding. Taken internally the water usually improves the secretions of the digestive organs and of the kidneys, increases the appetite, and sometimes causes perspiration or diuresis; its operation is, however, in many cases gradual, and not productive of immediate sensible effects. Its use, like that of the other thermal springs, is prejudicial in cases depending upon general or local plethora; inordinate vascular excitement; in dropsies, consumption, and other internal diseases connected with structural disorganisation.

A course of this water may generally be advised under the same circumstances as that of Wisbaden, which, however, is more applicable to persons of an indolent temperament, and to cases of very long standing. On the other hand, where the water of Wisbaden proves too stimulating, that of Baden-Baden may often be used with advantage: chronic arthritic and rheumatic pains, stiffness and contraction, functional derangement of the digestive organs, disordered general health without the existence of any special local disease, disease of the urinary apparatus with tendency

to the formation of lithic acid, bronchial irritation not of an inflammatory nature, and some cutaneous affections, — are among the complaints most likely to be removed by these springs.

*A Pint of Water from the Ursprung contains, according to Kastner,*

			Grains.
Muriate of Soda	-	-	- 17·500
Muriate of Lime	-	-	- 1·500
Muriate of Magnesia	-	-	- 0·500
Sulphate of Lime	-	-	- 2·750
Carbonate of Iron	-	-	- 0·111
			<hr/> 22·361

Carbonic Acid Gas 0·333 parts of a cubic inch.

#### GASTEIN,

Or Gasteiner Wildbad, is situate twelve German miles south-west of Salzburg, at an elevation of near 3000 feet above the level of the sea, in a highly romantic and secluded spot among the mountains. The village consists of about twenty houses, mostly of wood, built on a steep acclivity by the side of the torrent Acha, and is surrounded by lofty snow-tipped mountains. Notwithstanding its small size and indifferent accommodation, it is

a place of great resort for Germans and Russians on account of its coolness as a summer residence, the beauty of the scenery, and the reputation of its springs, which are said to have been used by the Romans. The principal ones are the Furstenquelle, the Doctorsquelle, the Staubingerquelle, and the Spitalquelle; they have a temperature from  $36^{\circ}$  to  $38^{\circ}$  R., and contain but a small proportion of fixed or volatile substance. Their operation, however, is said to be generally exciting, by their stimulating effects on the vascular system or on the skin, where they not unfrequently cause an eruption. They are chiefly recommended in nervous affections of an atonic character; derangement of the general health; paralysis, gout, rheumatism, and their consequences; chronic disease of the urinary organs, with disposition to the formation of stone; and some cutaneous diseases of long standing.

As the number of houses at the Wildbad was found to be insufficient to lodge the visitors who resorted thither, a new establishment was formed a few years ago at Hof-Gastein, two leagues from the springs, whence the water is conveyed through

pipes, and still retains sufficient heat to be used for baths, which is the principal manner of employing it. A course of baths is said to be as efficacious at the Hof as at the Wildbad.

*Solid Substance yielded by a Pint of the Water, according to Hünefeld's analysis.*

			Grains.
Sulphate of Soda	-	-	1·4331
Muriate of Soda	-	-	0·2834
Muriate of Potass	-	-	0·1405
Carbonate of Soda	-	-	0·0597
Carbonate of Lime	-	-	0·3394
Silex	-	-	0·3315
Magnesia	-	-	0·0100
Manganese	-	-	0·0138
Iron	-	-	0·0484
Sulphate of Sodium	-	-	0·0292
Earthy Phosphate	-	-	0·0292
Fluate of Lime	-	-	a trace
			<hr/> 2·7182 <hr/>

Although the sulphate, and not the muriate of soda, is here the predominating salt, it is in too small quantity to have any aperient effect.

#### BAGNÈRES DE BIGORRE,

Or Bagneres Adour, is one of the most frequented watering places in the Pyrenees, and well deserves



the preference accorded to it on account of its numerous *agréments* for a summer residence, the beauty of its position, and the reputation enjoyed by its springs. It is placed at an elevation of 1700 feet above the sea, and is encircled on all sides but the north by hills, whence descend numerous streamlets of clear water, which, while they freshen the air, produce a richness of vegetation rarely met with. The town, which was termed by the Romans Vicus Aquensis, is pretty regularly built, contains a theatre, museums, a cabinet of natural history, reading rooms, and several other buildings for the amusement of visitors; of these the Colisée and Frascati, which combine public rooms for restauration, music, balls, play, and reading, deserve special mention. The population during the season amounts to nearly twelve thousand persons. All the conveniences of life are met with as in large cities, and living is less expensive than at most of the Pyrennean springs. The public promenades and the beauty of the environs offer a variety of resources both to those who are fond of society and to those who need tranquillity and retirement.

The spots in the neighbourhood most frequently visited are the umbrageous Allées de Maintenon, situate above the town, and commanding a prospect over the valley; and the delicious valley of Campan, which I content myself with naming, as lengthened description would be misplaced in a work of this kind.

There are several handsome bathing establishments, public and private, of which the Thermes de Maria Therese is the principal. This building is isolated, and has a handsome façade upwards of two hundred feet long and thirty high: the chief entrance is beneath a central vestibule, where are the two principal drinking fountains, from which passages lead on either side to the bathing, douche, and fumigating cabinets, to several of which bed-chambers are attached; the first floor is disposed in the same manner. The edifice also contains a large *salle de reunion*, a reading room, and a billiard room; behind it is a large garden. The other principal establishments are the Bain de la Peyrie, De Santé, Du Pré, Lannes, Petit Prieur, La Gutiére, Lassere, and Pinac.

It has been stated that the mineral springs at

Bagnères de Bigorre were of three kinds,—sulphurous, saline, and chalybeate. Mention has already been made of the first; but the warm saline springs are most in request, and have to be considered here. They all possess the same constituent parts, though in variable proportions; and their action, though having in general great analogy with other warm saline springs, is more frequently aperient, especially the water of La Reine and Lassere, on account of the quantity of magnesia predominating over that of the muriate of soda; the other springs have more frequently a diuretic or diaphoretic operation. “Their action,” says M. Alibert, “resembles that of the other warm saline springs; viz. by exciting in the animal economy perturbatory movements, which become salutary by imparting an acute character to diseases, the nature of which is to perpetuate themselves in the system to the detriment of the persons labouring under them. I especially recommend them to hypochondriacal and melancholic persons. It is there (Bagnères) that those abdominal diseases and irregularities in the digestive functions, which so frequently attack

literary persons and all who follow sedentary occupations, will be alleviated. Thither also should be sent women weakened by accouchment, profuse discharges, or even by moral anxieties." In short, these springs will be applicable to most of the cases in which the water of Baden-Baden has been recommended, though it will be seen from the following table that they contain a much smaller proportion of saline substance. Some of them, however, contain much more free carbonic acid than the springs of Baden.

*Twenty-five Pints of Water.\**

	Bains de Marie Therese.		Bain de la Peyrie.	De Santé.	Lannes.	Petit Prieur.
	Fontaine Nou- velle.	Foulon.				
Temperature - -	39° 6'	33° 6'	27° 4'	31° 2'	36°	35°
Carbonic Acid Gas (cubic inches) - }	9.50		9.44			
	Grains.	Grains.	Grains.	Grains.	Grains.	Grains.
Muriate of Magnesia	13.95	3.55	5.36	5.56	5.36	7.3
Muriate of Soda -	1.5	8.15	2.58	1.88	1.68	2.12
Sulphate of Magnesia	6.75	3.17	5.90	9.90	8.10	7.9
Sulphate of Lime -	45.45	3.95	19.7	37.6	39.4	42.8
Carbonate of Lime -	4.55	3.10	6.20	6.5	6.50	8.6
Carbonate of Magnesia	1.45	1.8	1.70	1.48	1.44	1.24
Resinous Substance -	0.18	0.3	0.10	0.18	0.10	0.12
Extractive - -	0.10	0.12	0.18	0.20	0.20	0.16
Silex - -	1.10	1.00	0.45	0.75	1.40	1.3
Loss - -	0.97	0.86	0.39	0.73	0.82	0.87
	66.00	26.00	40.50	64.58	65.2	72.40

\* Dict. de Medicine, nouvelle edition, 1833.

The chalybeate springs have a similar composition with the above, with the addition of iron, which exists in the largest proportion in the springs La Reine and Du Dauphin, belonging to the Thermes de Maria Therese. St. Roch, des Yeux, and some private springs also belong to this class. The spring D'Angoulême is rich in iron, and differs from the others by the predominance of potass over the other saline ingredients. These waters present no particular advantage over others of the same class which have been described; they are, however, highly valuable to invalids at Bagnères, as their use may be combined with that of the other springs, and in many cases they may be subsequently used with advantage.

## BOURBONNE-LES-BAINS

Has long been one of the most frequented watering places in France, and was termed by the Romans *Aquæ Borvonis*. It lies seventy-two leagues south-east of Paris, in the department of the Haute Marne, partly on the acclivity of a hill, and partly in the two valleys at its foot.

The northern valley is watered by the little river L'Apance ; the southern one, which is much narrower, contains the mineral springs. A civil and a large military hospital, for poor invalids to whose cases the water is applicable, are supported by the government. Exclusive of the military, there is accommodation for about 1200 strangers.

Bourbonne is placed at a considerable elevation above the sea ; to which circumstance and to the peculiarity of its position the variableness of its climate is chiefly ascribed. Rain frequently falls, and storms are common in the summer months ; the temperature of the atmosphere is likewise subject to great transitions.

There are three thermal springs. La fontaine Chaude, or Matrelle, furnishes the greatest quantity of water, and is principally used for drinking ; it has a temperature of 46° R. The others are the Bains Civils (45°) and the Bains Militaires (40°). A considerable quantity of azote escapes from these springs, especially during the prevalence of storms. Few mineral waters contain so much saline substance. According to the latest analysis two pints yielded —

		Grains.
Muriate of Soda	-	- 100
Muriate of Lime	-	- 16
Carbonate of Lime	-	- 3
Sulphate of Lime	-	- 15
Sulphate of Magnesia	-	- 16
		<hr/> 150 <hr/>

A course of these waters is more especially commendable in scrofulous cases, chronic rheumatism, old sprains, pains from old wounds, and paralysis unconnected with apoplexy. It is contra-indicated in gout, diseases of the urinary organs or of the skin, particularly if attended with febrile excitement. Nervous, delicate, highly irritable, or sanguineous persons should abstain from their use, or use them with great caution, as their operation is much more exciting than the generality of waters of the same class.

The civil bathing establishment comprises upwards of fifty bathing cabinets, sixteen douches, two vapour baths, and two piscinæ for poor persons to bathe in. The number of invalids at Bourbonne averages 800 yearly, exclusive of their friends, or of the military, of whom from 600 to 800 are also treated every year by these waters.

## LEUK.

To the left, and a little above the road passing through the Valais to the Simplon, stands the village of Leuk : the baths of the same name, which rank among the first in Switzerland, lie about a league distant, at the foot of the Gemmi, and offer little inducement for a protracted sojourn to persons not desirous of using the water ; even these would derive equal, if not more, benefit from other mineral springs placed in a less dreary situation. The houses are badly built and inconvenient ; until very lately even many necessary articles were only to be procured by sending to a considerable distance. Leuk is principally resorted to by the Swiss and French ; few English would like to put up with its manifold inconveniences.

There are in all twelve springs ; the temperature of the principal one is 45° R., that of the others somewhat lower : they contain a very small quantity of salt, and are mostly used for bathing. The baths form four squares under one roof, and are separated from each other by canals, through



which flows water fresh from the springs, which is drunk by the patients while in the bath. Each square is large enough to allow forty persons to bathe at the same time. The Herrenbad is used by the higher class; the Junkerbad by persons not disposed to pay the price of the former; and the Armenbad by poor persons, and the peasantry of the neighbouring country, who resort to Leuk for relief, chiefly from the rheumatic affections so prevalent in the Swiss valleys. Friction and cupping glasses are employed to second the action of the water.

When a person begins a course of the baths, he is presented with a flannel bathing gown, which covers the body, and a tippet of the same material for the shoulders. The cure or period of treatment is usually of three weeks' duration: on the first day the patient merely remains an hour in the bath, on the second day two hours, the time being thus gradually increased to six or eight hours a day,—four in the morning and four in the afternoon. Most persons have floating tables before them to hold their handkerchief, snuffbox, books, &c. The third week is that of the *de-*

*baignée*, during which the time of remaining in the bath is gradually diminished. There are no separate baths for the female sex.

These springs have acquired a high reputation in paralytic affections; long-standing eruptions on the skin, especially of the scaly kind; gout, rheumatism, and abdominal engorgement. Their action is not very energetic, and there is no doubt but that their beneficial effects are more attributable to the continued impression of warm water upon the surface for several hours daily, than to any specific virtues they possess.

#### PFEFFERS.

These baths lie not far from Ragatz in the Grisons, in a singularly wild and sombre dell, several hundred feet below the level of the surrounding country, and but seldom enlivened by the rays of the sun. They are not approachable by any kind of vehicle: a steep mule-path, winding up the hill on one side, and on the other flights of steps, are the only roads by which they can be reached. There is only one large bathing and

lodging-house, kept by part of the brotherhood of the abbey of Pfeffers, which is situate three or four miles off. The spring lies at some distance from the bathing-house, to which the water is conducted through a wooden trough. Persons desirous of seeing it are conducted between rocks three or four hundred feet high, and so closely approaching each other at the top as barely to leave a cleft, through which a narrow strip of sky is perceptible. The path, composed of planks fixed along the side of the rock, is too narrow to admit of more than one person at a time, and immediately overhangs the Tamina, a foaming mountain torrent, which, with deafening noise, forces its way beneath. It is not, however, my intention to give a detailed account of this remarkable place, which, although well worth visiting, presents no inducement for the sojourn of English invalids.

The spring has a temperature of 29° R.: it contains but a small quantity of saline substance, scarcely three grains to the pint; and although resorted to every season by many Swiss and German invalids, possesses no advantage over others, where the ordinary conveniences of life,

and space for exercise, are found. Persons both drink and bathe. Some remain three or four hours daily in the bath.

### PLOMBIÈRES

Is a small town of two thousand inhabitants, situate in a narrow valley of the Vosges, six leagues from Epinal. The springs were known to the Romans, and were formerly supposed to contain lead, from which circumstance the name is derived: they are a good deal frequented every summer. The principal ones are Le grand Bain (50° R.), Le Bain des Dames (43°), La Source du Chêne (40°), Des Capucins (36°), Des Etuves (42°), D'Enfer (52°); this last supplies the Bain Neuf, an establishment completed in 1819.

The different springs of Plombières supply sixty-seven bathing and douche cabinets, and ten piscinæ or reservoirs. The water is clear, nearly tasteless, and feels oily to the touch. It is principally used in rheumatism and paralysis, visceral engorgement and stomach derangement, strumous

diseases, some cutaneous eruptions, and nervous affections.

*According to Vauquelin's analysis, thirty-two ounces contain*

		Grains.
Carbonate of Soda	-	- 1
Sulphate of Soda	-	- 2
Muriate of Soda	- -	- 1
Animal Matter	-	- 1
Silex	- -	- 1
Carbonate of Lime	-	- $0\frac{1}{2}$
		<hr/> 6 $\frac{1}{2}$ <hr/>

## BOURBON L'ARCHAMBAUT,

A small town, six miles from Moulins, situate in a pretty valley, sheltered on every side by hills, which preserve an equable state of temperature. The principal spring rises bubbling in the centre of the town, and supplies the thermal establishment, which comprises sixteen bathing cabinets, provided with douching apparatus; its temperature is 40° R. It contains free carbonic acid, bicarbonate of soda, muriatic acid, and sulphate of soda; a small quantity of carbonate of lime, iron, and silex; and is mostly used for baths, fumiga-

tions, douches, and injections; in chronic rheumatic pains, paralysis, long-standing enlargements of joints, and scrofulous cases. The water is likewise taken internally by many patients. A chalybeate spring also rises in the town.

#### BOURBON-LANCY.

This little town, in the department of Saone et Loire, lies on the side of a hill in an agreeable country, thirteen leagues south-west of Autun. The air is pure, and the temperature of the atmosphere equable. Alibert states, in proof of its salubrity, that epidemic diseases are scarcely ever heard of at Bourbon-Lancy, and that numbers of old persons are seen without the infirmities of age. The waters enjoyed great celebrity, but have been less resorted to of late years, to which the bad state in which the bathing establishment was kept may have contributed.

There are seven springs, of a temperature varying from 33° to 46°. They contain carbonic acid gas; a large proportion of muriate of soda; also sulphate of soda, carbonate of soda, sulphate of lime, with a trace of iron and silex.

The water is useful in cases to which that of Bourbon L'Archambaut and others of the same class are applicable, especially in chronic catarrhal affections and visceral engorgement. Douches are also much used in several local diseases.

## LUCCA.

The baths of Lucca lie in a delightful valley of the Appenines, on the little river Lima, about fourteen miles from the town and forty from Florence. Being in one of the coolest and most picturesque spots in Italy, the baths are greatly frequented in the summer, more as an agreeable retreat than for the sake of the springs. The hotels and lodging-houses are convenient, presenting the aspect of cleanliness and comfort. The population is honest, cheerful, and obliging; and the environs abound in beautiful walks and drives sheltered by chesnut trees, so that exercise may be taken at any hour of the day. The season lasts from the middle of May to the end of August, during which period the weather is generally fine and settled.

Three separate parts, or villages, distant from each other, are included under the name of the Baths of Lucca. The Ponte Seraglio and the Bagni alla Villa are close to the river, and about a mile from each other. At the villa near the latter the Duke usually passes the greater part of the season, and contributes much to the amusements of the place. The Bagni Caldi are placed on a hill overlooking the Ponte Seraglio. The springs rise from within the hill; and the principal baths are established at the Bagni Caldi, and on the road leading up to it. The water does not contain much saline substance, but owes its medicinal properties chiefly to its high temperature. It is only used for bathing; and is applicable to those cases in which the weaker thermal saline waters are indicated, especially if the persons whom it would suit are desirous of passing the summer in Italy.



## SALINE APERIENT SPRINGS.

THIS class of springs is distinguished from others in containing, as a predominating ingredient, sulphate of soda (Glauber's salt), or sulphate of magnesia (Epsom salt), which sometimes exists in large quantity: the other mineralising substances exist in comparatively small proportion. Some of these springs are very gaseous, and of a high temperature; others are cold, and contain but little gas. These circumstances, with the quantity and nature of the saline particles, the state of the individual, &c., determine their operation. The hot springs are usually energetic in their action, and exceedingly exciting to the system generally, stimulating the vascular apparatus and increasing the secretions. The cold ones are antiphlogistic, cooling; and aperient, purgative, or diuretic, according to the quantity taken, &c. They usually bear exportation well; and are less objectionable than the majority of mineral springs in states of vascular plethora, febrile affections, and visceral congestion. Artifi-

cially prepared, they are nearly as efficacious as the natural waters ; especially the imitations of those which contain but little carbonic acid gas. Manufactured Epsom, Seidlitz, or Cheltenham salts are but little inferior in efficacy to those procured from the springs themselves, and are very commonly used in the ordinary practice of medicine. As the prolonged action of saline aperient springs is frequently debilitating, it is occasionally requisite to suspend the course for a short time.

## CARLSBAD,

Or Karlsbad, is built in a narrow valley on both sides of the Tepel, as it winds between high hills clothed with wood and verdure. With respect to the beauty of its position, Karlsbad has the advantage over most watering places; and, seen from any point, presents a highly picturesque and romantic appearance. The town consists principally of two or three long streets, following the windings of the valley, and terminating in the Wiese, a wider street, with houses built against the rock on one side, and an avenue of trees, with shops and booths, on the other, near the river. The two principal restaurants, where, also, concerts and public balls take place,—the Salle de Saxe and the Salle de Bohème,—are at the end of the Wiese; whence a delightful road, well shaded by fine avenues of trees, leads through the valley to Marienbad. This is the most usual drive for visitors, who frequently repair in the evening to one of the houses or public gardens in the neighbourhood, to take tea, coffee, or ice.

Numerous agreeable shady paths, easy of ascent, enable pedestrians and donkey-riders to attain the heights. One of these, which commands the best view of the town, is termed the Hirschsprung, from the traditional account given of the Emperor Charles IV., who, while hunting a stag, brought the animal to bay at this spot, whence it leaped down into valley: its being overtaken at the Sprudel occasioned the discovery of this spring, from which the Emperor, at a subsequent period, being wounded in the wars, derived so much benefit, that he founded and gave his name to the town; which soon increased considerably in size, and became one of the first watering places in Europe.

The number of inhabitants amounts to about 3000, which is more than doubled in the season. The accommodations, though very good, are inferior to those at the principal bathing places near the Rhine. There are no tables d'hôte, dinners being served *à la carte*. The chief indoor public amusements are the theatre, concerts, and balls: gaming tables are prohibited, as at the other baths belonging to Austria. The environs are

extremely beautiful, especially in the direction of the Kreutzberg, the valley of the Egra, and Elnbogen.

The mineral waters of Carlsbad are among the most powerful in Europe, on account of their high temperature, and the quantity of their saline and gaseous parts. Their action is exceedingly penetrating and stimulating, and is in most cases sensibly experienced by the patient, in the increased secretion from the alimentary canal, the kidneys, or the skin; or in the effects produced on the nervous or vascular systems, according to the spring which is used, the mode of using it, the state of the individual, &c. The Sprudel, the Muhlbrunnen, the Neubrunnen, and the Theresienbrunnen are the springs most employed: the Bernhardsbrunnen, the Schlossbrunnen, and the Spitalbrunnen are less so. There is no material difference in the nature of their component parts; but the quantity of substance held in solution, and the heat of the water, vary in each — which enables them to be adapted to different indications.

The Sprudel is the hottest and most powerful

in its action; the temperature is  $59^{\circ}$  R. The water is thrown up with great force into the air, forming a perpetual *jet d'eau* four or five feet high, and emits an odour similar to that caused by the boiling of animal matter: it is clear, colourless, of a saltish not unpleasant taste, but becomes discoloured on exposure to the action of the air; depositing a yellowish brown sediment. A considerable quantity of vapour escapes, which extends to some distance, and near the spring is of considerable density. Close to the Sprudel is the new Sprudel, which greatly resembles it. The Neubrunnen has a temperature of  $48\cdot50^{\circ}$ : the Muhlbrunnen, from  $45^{\circ}$  to  $47^{\circ}$ ; the Theresienbrunnen,  $42\cdot45^{\circ}$ : these three are near to each other on the left bank of the river.

From their powerful effects on the mucous membranes, absorbent system, and parenchymatous viscera, the waters of Carlsbad are highly efficacious in the removal or mitigation of abdominal engorgements, induration of the liver or spleen following acute disease; hypochondriasis with constipation; piles; menorrhagia, and other derangements of the uterine secretion not of an

inflammatory nature ; enlargement of the lymphatic and salivary glands ; chronic gout, when accompanied by much stomach and liver disorder ; long-standing disease of the kidneys, with tendency to the formation of stone ; some cutaneous affections, especially when of syphilitic or mercurial origin ; enlargement and chronic disease of joints. They are contra-indicated in persons of a full habit of body, and those liable to cerebral congestion, unless these states have been in some measure removed, previously, by preparatory treatment ; in cases of structural disorganisation, as consumption, acute gout with calcareous deposits ; hemorrhage, epilepsy, and other convulsive diseases. The particular spring to be used is determined by the physician. When a strongly stimulating operation is required, the Sprudel will be chosen ; in other cases, or where this is not well supported, one of the others will frequently agree better, as they are more aperient and less heating than the Sprudel.

Some persons both drink and bathe, though in general the bath is not much used. There are only two bathing-houses : one near the Sprudel,

with nine cabinets ; and one near the Muhlbrunnen, for the other springs, which only contains six baths. Douches and vapour baths are not often recommended.

For a more detailed account, see Ryba—"Karlsbad und seine Heilquellen, ein Handbüch für Kurgäste;" De Carro — "Carlsbad et ses Eaux Minérales."

*Analysis of Sixteen Ounces of Water, by Reuss and Steinmann.*

	Sprudel.	Neubrunnen.	Muhlbrunnen.	Theresienbrunnen.
Sulphate of Soda -	18·466	18·049	17·816	15·733
Carbonate of Soda	10·000	10·500	10·336	8·860
Muriate of Soda -	8·933	8·833	8·716	7·783
Carbonate of Lime	3·433	3·449	3·625	3·717
Silex -	0·633	0·556	0·549	0·466
Iron -	0·033	0·033	0·033	0·016
Grains	41·498	41·430	41·085	36·575
Carbonic Acid Gas } (cubic inches)	11·850	14·632	15·333	15·333

#### MARIENBAD.

Having given an account of the chalybeate springs of Marienbad under their proper division,



I have now to consider the aperient saline springs, which, though resembling the others in the nature of the ingredients which they contain, differ materially from them with respect to the relative proportions; thus, while a pint of water from the Carolinenbrunnen scarcely contains three grains of Glauber's salt, the same quantity from the Kreuzbrunnen contains twenty-four grains; the other salts are also in much greater proportion in the latter spring, though the amount of iron is much the same in both.

Two springs at Marienbad come under the division of saline aperient waters,—the Kreuzbrunnen, and the Ferdinandsbrunnen: they are cold (9° R.); the water is clear as crystal, without smell, of an agreeably piquant saline taste, and is in general well supported by the stomach. Taken in a certain quantity, as from four to six glasses daily, it produces purgation, without, however, causing debility either of the system in general or of the digestive powers; in smaller quantity, and under particular states of the constitution, its action is diuretic. The Kreuz-

brunnen is the most used of all the springs at Marienbad, and large quantities of its water are annually exported. It has been termed the cold Carlsbad, and in the nature of its constituent parts bears great analogy with the Carlsbad water. It contains, however, more neutral salts; is consequently more purgative; and on this account, as well as by reason of its low temperature, is less heating, and is preferable to the water of Carlsbad where any tendency to plethora, to cerebral congestion, or to hemorrhage exists. In fact, though, generally speaking, the saline spring of Marienbad and those of Carlsbad are applicable to the same class of cases, the former should be preferred, when from peculiar circumstances the latter would be likely to disagree.

A course of the Kreuzbrunnen water is more especially indicated, where no great irritability of the system exists, in cases of impaired functions of digestion, with constipation and inactivity of the liver; in the disposition to the formation of gallstones; derangement of the general health without evident disease; hypochondriasis; chronic

gout, when combined with much stomach derangement ; hemorrhoids, dysmenorrhœa, and sterility, when arising from a torpid or congestive state of the uterine system. Many patients combine baths with a course of this water, which is also in some cases advantageously followed by the use of the chalybeate springs.

The Ferdinandsbrunnen is about a mile from Marienbad. Its temperature is somewhat lower ; it contains less salt, but more free carbonic acid, than the Kreuzbrunnen ; hence it is less aperient, but has a more stimulating action on the nervous and vascular systems. While the Kreuzbrunnen is better suited to persons of strong constitution, the Ferdinandsbrunnen agrees better with weakly individuals, and those of a more phlegmatic temperament. Its water is principally used for drinking, and is likewise exported in considerable quantity.

For a fuller account of the springs of Marienbad, see the works of Heidler, Kreysig, and Gerle.

*Analysis of Sixteen Ounces of Water, by Reuss and Steinmann.*

	Kreuzbrunnen. Reuss.	Ferdinandsbrunnen. Steinmann and Reuss.
Sulphate of Soda	- 23·677	14·514
Muriate of Soda	- 8·993	6·450
Carbonate of Soda	- 15·030	13·152
Carbonate of Lime	- 3·310	4·694
Carbonate of Magnesia	- 1·750	2·464
Iron	- 0·286	0·346
Silex	- 0·460	0·584
Extractive	- 0·306	- -
	- 50·812	42·204 grs.
Carbonic Acid Gas } (cubic inches)	8·384	13·736

#### FRANZENSBRUNN.

The Salzquelle, or saline spring at Franzensbrunn, rises at some distance from the village, but is connected with it by a long covered gallery, which enables patients to walk to the spring, and take exercise, in bad weather. The water sparkles less than that of the other springs, but has a more saline taste: its temperature does not exceed 9°. Several thousand flasks are annually exported. Though containing less sulphate of soda than the Franzensquelle, its action is more aperient, on account of the smaller proportion of free car-

bonic acid, and the trifling amount of iron, which enter into its composition: hence it is better suited to individuals of a full habit of body; to cases attended with nervous irritability or a disposition to inflammation, especially diseases of the liver, or other abdominal viscera, with constipation of the bowels; hypochondriasis, piles, nervous asthma, irritation of the kidneys accompanied with formation of gravel, obstruction or irregularity of menstruation dependent upon local plethora, or an irritable state of the system; and scrofulous cases in irritable subjects, with whom chalybeate, or thermal saline springs, would be likely to disagree.

This spring is sometimes used preparatory to a course of the others; or when these prove too exciting.

Sixteen ounces of water contains, according to Tromsdorf —

		Grains.
Muriate of Soda	-	- 9·2160
Sulphate of Soda	-	- 17·9333
Subcarbonate of Soda	-	- 9·3200
Carbonate of Lime	-	- 0·1320
Carbonate of Magnesia	-	- 1 6066
Strontian	-	- 0 0026

			Grains.
Iron	-	-	- 0·0160
Manganese	-	-	- 0·0040
Phosphate of Magnesia	-	-	- 0·0040
Silex	-	-	- 0·3333
			<hr/> 38·5678

Carbonic Acid Gas, 14·085 cubic inches.

#### PYRMONT.

One spring for drinking, and two for bathing, at Pyrmont, may be placed under the head of saline aperient waters. They are very rich in free carbonic acid, and in saline substance, of which a pint contains 92 grains—the muriate of soda being in the greatest proportion; the other salts are principally the sulphates of soda, lime, and magnesia, and muriate of lime. The water is clear, very sparkling, and has a saline bitter taste: its temperature is 9° R. Internally taken, its sensible operation is laxative, purgative, or diuretic, according to circumstances. It stimulates the lymphatic glandular system, and promotes absorption, especially when joined to baths which strongly excite the capillary vessels of the skin, and give tone to the whole surface: hence a

course of this water is highly serviceable in glandular enlargement, and most scrofulous cases; in nervous affections accompanied with general irritability or hysteria; in some kinds of paralysis; stomach and liver derangement, with torpor of the abdominal venous circulation; gout with deposit of calcareous matter in the joints, and those cutaneous affections where a stimulating action on the surface is required.

This water is sometimes used conjointly with the chalybeate springs, with great advantage.

## SEIDLITZ

Is a village in Bohemia, not many miles from Teplitz, celebrated on account of its bitter purging water. The predominating salt is the sulphate of magnesia, of which there are more than 100 grains to the pint. As it is not gaseous, the water does not lose its properties by being carried to a distance, and is for the most part exported, — few persons resorting to the spring for the sake of drinking it there. Its operation is cooling and antiphlogistic, affecting chiefly the mucous mem-

brane and glands of the stomach and bowels; increasing their secretions and excretions; and consequently producing a revulsive effect from the head, thoracic viscera, and the surface, removing congestion, and diminishing inflammatory action in these parts. Taken in small quantities, its operation is usually confined to the kidneys — the secretion of which it increases.

A water of this kind may be exhibited in all cases where saline purgatives are indicated; especially in local or general plethora; constipation, with deficient secretion of bile; acute gout; dropical effusion of an inflammatory nature; cutaneous eruptions of an acute character, particularly acné, and others affecting the face. It is contra-indicated in weakly constitutions, and highly nervous persons; in debility of the digestive powers, with tendency to diarrhœa; hemorrhages of a passive nature; and diseases of an atonic character, attended with general debility.

The salts of this and some other cold springs of the same class are imitated, and used largely in the ordinary practice of medicine.



A pint of Seidlitz water contains —

		Grains.
Sulphate of Magnesia	-	- 104
Sulphate of Lime	-	- 8
Carbonate of Lime	-	- 8
Muriate of Magnesia	-	- 3
Carbonate of Magnesia	-	- 3
		<hr/> 126 <hr/>

## SAIDSCHÜTZ.

Several springs rise in the neighbourhood of this village; but the water of two only—the Hauptbrunnen and the Kossbrunnen—is used for exportation. Though differing from that of Seidlitz in its chemical composition, its operation is very analogous, and it is applicable to the same kind of cases. The quantity of carbonic acid gas which it contains is too small to have any material effect upon its action.

A pint of the water contains, according to Steinmann —

		Grains.
Sulphate of Magnesia	-	- 78·735
Nitrate of Magnesia	-	- 20·274
Muriate of Magnesia	-	- 2·606

			Grains.
Carbonate of Magnesia	-	-	1·100
Sulphate of Potass	-	-	22·932
Sulphate of Soda	-	-	27·113
Sulphate of Lime	-	-	2·496
Carbonate of Lime	-	-	4·838
Strontian	-	-	0·024
Iron	-	-	0·108
Manganese	-	-	0·028
Earthy Matter	-	-	0·018
Silex	-	-	0·061
Extractive	-	-	0·385
			<hr/>
			160·718

Carbonic Acid Gas, 3·304 cubic inches.

#### PULLNA.

This village, situate not far from Seidlitz and Saidschütz, possesses mineral springs of a similar nature, though much richer than either of the others in saline substance — a pint of the water holding in solution no less than 240 grains: its action is consequently more energetic and debilitating; few persons being able to bear the continued operation of this water, or of that of the two preceding springs. Only one spring at Pullna

is used for the exportation of the water, which, according to Struve, contains, in sixteen ounces,

			Grains.
Sulphate of Soda	-	-	- 123·800
Sulphate of Potass	-	-	- 4·800
Sulphate of Lime	-	-	- 2·600
Sulphate of Magnesia	-	-	- 93·086
Muriate of Magnesia	-	-	- 16·666
			<hr/>
			240·952
			<hr/>

## ALKALINE SPRINGS.

CARBONATE of soda is found in greater abundance than other salts in this class of mineral springs: the carbonates of lime and magnesia, sulphate and muriate of soda, are likewise usually met with, though sometimes in small quantity. Free carbonic acid forms a component part of most alkaline springs: its proportion, and state of combination with the other constituent parts, materially influence their operation; which is less stimulating than that of sulphurous, chalybeate, or thermal saline springs, and is essentially alterative—being often not perceptibly experienced at the time. Taken internally, these waters affect principally the mucous membranes of the stomach and bowels, urinary apparatus, and air passages,—altering the quality, and sometimes increasing the quantity, of their secretions. Used in the form of bath, they usually have a sedative effect upon the nervous system; allaying irritation, slightly increasing the action of the cutaneous capillary vessels and of

the absorbents; frequently imparting softness and clearness to the skin; and affecting, in a secondary manner, internal organs.

The hot springs of this class, which are rich in saline substance, are more especially indicated in atonic states of the constitution, and in cases of deficient secretion: those, on the other hand, which contain a smaller proportion of saline and gaseous matter, are less exciting, more sedative, and consequently preferable for delicate or weak persons, in cases attended with increased vascular excitement or irritability of the nervous system. Where, however, there exists either great debility of the system, organic change of the lungs or other important parts, a state of general plethora, a tendency to apoplexy or to dropsical affection—these, as well as most other mineral waters, are contra-indicated.

The cases in which they may be employed with greatest probability of advantage, are, stomach derangement, with acidity and deficient biliary secretion; gouty complaints complicated with such derangement; disease of the urinary organs, when not attended with obvious inflammation, but with

tendency to the formation of gravel or stone of the lithic acid, or even in some cases of the phosphatic variety ; laryngeal and bronchial irritation, impaired uterine functions, many nervous disorders, and some cutaneous diseases.

## TEPLITZ.

This small town lies about half way between Dresden and Prague, in a fertile valley, bounded on the north-west by the Erzgebirge, and on the other sides by gently rising hills. Eastward is the Schlossberg,—the highest mountain in the valley,—whose summit is crowned by the ruins of a castle, whence a delightful and extensive view may be enjoyed. It is a clean but not handsome town, most of the streets being narrow: the only open place that can be termed a square, is the Schlossplatz, in front of the palace of the Prince de Clary. The hotels are, however, numerous and large, the accommodations good, and the walks and drives agreeable. Prince Clary's garden behind the palace is extensive, tastefully laid out, and is the most frequented promenade. Here is a restaurant, where parties meet to dine at the table d'hôte, or to eat ice: here, also, a musical band plays at stated hours. The theatre, balls, and concerts form the chief public amusements.

Teplitz has long been a favourite summer retreat for crowned heads, diplomates, and persons

of rank. The King of Prussia has a handsome palace, where he usually resides during the season. Some principal mineral springs rise in the garden behind it, where a fountain and semicircular portico have been constructed, within these two years, for the accommodation of drinkers ; who, however, are few in number compared with that of the bathers. In 1833, 5300 persons used the baths. These consisted, for the most part, of Germans, Russians, and Poles.

Among the interesting spots in the neighbourhood, may be mentioned, Thurn, Schlossberg ; Wachholderberg, with its delightful promenades ; Doppelbourg ; the oak forest ; the ruined fortress Dobrowskahora, an ancient stronghold of the Templars.

Teplitz, with the adjoining village of Schoenau, contains upwards of 3000 inhabitants. The several springs which rise in and about Teplitz do not materially differ in their composition, but there is considerable difference in their temperature : those in the town are the warmest ; those in the suburb the coolest ; while those which rise in Schoenau hold, with respect to temperature, an



intermediate position between the others. The Ursprung, or chief spring, is  $39^{\circ}$  R., and supplies the principal bathing-house in the town. The Frauenbad, or women's bath, has a temperature of  $38^{\circ}$ ; the Trinkquelle and Augenquelle,  $21^{\circ}$ ; the Steinbadquelle, in Schoenau,  $30^{\circ}$ ; the Wiesenquelle,  $25^{\circ}$ ; the Schlangenbad,  $30^{\circ}$ ; the Schwefelbadquelle,  $34^{\circ}$ .

The water is clear and colourless, has a slightly saline taste, no smell, and when fresh drawn a few bubbles escape. Baths of the hotter springs are stimulating; increase the frequency of the pulse, and frequently also, when first taken, rheumatic or gouty pains which previously existed: they sometimes cause restlessness, constipation, and determination of blood to the head; and, consequently, should be preferred in cases where a strong excitation of the nervous, vascular, and muscular systems is required: as in long standing rheumatism, obstinate gout, with acidity of the stomach, and calcareous depositions in the joints; in ankylosis, contraction or chronic swellings of joints, muscular rigidity, inveterate cutaneous diseases, and old ulcers. The cooler springs have a

more sedative operation and are better adapted to weak persons: to cases attended with nervous irritability; of renal or vesical irritation; paralysis; chronic mucous discharge from the uterus; irregularity of menstruation; scrofulous indurations and ulcers; dry eruptions on the skin, accompanied with itching,—as lichen, prurigo, chronic eczema, and impetigo; and spasmodic affections of an hysterical nature.

There are altogether eighty-four baths in Tep-litz and Schoenau, independently of those in private apartments: they are divided into town baths (Stadtbäder) and stone baths (Steinbäder). The principal town bath consists of three reservoirs, or public baths, one for men, a second for women, and the third for females of the lower class; and of twenty-four bathing cabinets: the prince's bath (Fürstenbad) has one public bath, and ten bathing cabinets; the Herrenhaus has six baths; the Steinbad at Schoenau has two reservoirs, and fourteen separate baths; the Schlangenbad has eight bathing cabinets; the Schwefelbad four.

*Analysis of a Pint of Water from the Hauptquelle, or Ursprung,  
by Ambrozzi.*

			Grains.
Sulphate of Soda	-	-	1·696
Muriate of Soda	-	.	0·776
Carbonate of Soda	-	-	12·240
Carbonate of Lime	-	-	0·340
Silex	-	-	0·420
Extractive	-	-	0·100
Carbonate of Iron	-	-	0·036
			<hr/>
			15·608

Carbonic Acid Gas 2·400 cubic Inches.

## EMS.

Ems consists of a long range of houses on the right bank of the Lahn, two German miles from Coblenz. Between the hills which rise steeply behind it to a considerable height, and the river, there is barely space for the road and the public promenade. All the houses are either hotels or lodging-houses; so that upwards of 2000 visitors can be lodged at the same time. The principal building, termed the Curhaus, belongs to the duke, and stands in the centre of the village: on the ground floor are two fountains where the water is drunk; between the two fountains a long

passage extends, with stalls on either side for the sale of fancy articles. The upper stories of the building are disposed in apartments; the price of each is ticketed on the door, being fixed by the government: this is also the case at the hotels, where the accommodation is of the best kind. The public garden, opposite the Curhaus, is prettily laid out; in it are the rooms for play, restauration, and public balls: an excellent band plays morning and evening at the time of drinking the water. The only road for carriages is the one passing through the valley from Nassau to Coblenz. There are, however, several pleasant paths on the opposite side of the river, and among the hills; those who dislike walking usually hire donkeys which are numerous and well conditioned. There are also sedan chairs, which are preferred by some invalids for taking exercise.

The drive up the valley to Nassau is one of the excursions most frequently made. This pretty hamlet lies in a charming situation on the same side of the river, which is crossed by a neat suspension bridge. The ruins of two castles, on a hill overlooking the village, form a prominent and

interesting feature in the scene. Nassau is about three German miles distant from Schwalbach.

The springs of Ems are among the most ancient in Germany ; the two principal ones are the Kesselbrunnen and the Kranchenbrunnen, which contains the greatest proportion of carbonic acid gas: the temperature of the former is 120° Fahrenheit; that of the latter about 85°. Baths are much used: many persons, however, both drink and bathe. The water is well adapted to delicate individuals and to children, with whom more powerful springs generally disagree: it has a sedative operation on the nervous system, promotes the secretions of the skin and of the kidneys, but not those of the digestive organs. Most patients, after having employed the water for some time, experience a degree of lassitude and indisposition which lasts for a longer or shorter period, but which is generally succeeded by a sensible amelioration of their health.

The mineral springs of Ems have long enjoyed the reputation of great efficacy in incipient phthisis, chronic affections of the lungs and air passages, nervous diseases, and some complaints

peculiar to females; as also in sterility: one of the springs having received the name of Bubenquelle for its supposed power in these cases. That many patients affected with chronic catarrh, asthma, and bronchial disease resembling phthisis, or even in the early stage of this disease, have derived much benefit from these waters is unquestionable. Where, however, the development of tubercles in the lungs is evident, these, as well as other mineral waters, will be prejudicial; yet where there merely exists a predisposition to the disease, a course of Ems water is likely to be attended with great advantage, especially if such predisposition be dependent upon a scrofulous diathesis, with glandular enlargement and general debility, or a tendency to marasmus.

According to Dr. Kreysig, the Ems waters will produce a good effect in those nervous complaints which depend upon an alteration of the blood and secretions; in too high susceptibility of the nervous system, induced by moral causes, or debilitating discharges, and especially in hysterical spasms. The same physician extols their efficacy in cases of obstructed abdominal circulation with piles,

or the disposition to gouty affection, and to the formation of stone in men weakened by the effects of their disease. He particularly recommends them in scrofula, and its consequences,—as ulceration, distortions of the feet, articular swellings, &c., occurring in children. With respect to their effects in cases of sterility, Dr. Kreyzig considers that where this state is dependent upon abdominal sanguineous congestion, with deteriorated quality of the blood upon moral impressions, or upon both these causes united, the waters of Ems are efficacious, both by their tranquillising effect upon the nervous system, and by their general alterative properties, restoring the equilibrium between the vital state of the uterus, and that of the system in general. In the same manner, by removing the internal cause, these waters will be highly serviceable in many cases of suppressed, irregular, or painful menstruation, fluor albus, &c.

Baths are generally taken every morning; and it is very important that their temperature be exactly regulated, in order that too great a degree of excitation be not produced. In general,

the temperature of the bath should be between 24° and 28° Reaumur, where there exists increased susceptibility of the nervous system, or a disposition to sanguineous congestion. In other cases, where a more stimulating action is required, the temperature may be somewhat higher.

*Solid Substance contained in Sixteen Ounces of Water from the  
Two principal Springs.*

	Kesselbrunnen. Kastner.	Krankenbrunnen. Struve.
Carbonate of Soda	- 20·0000	9·7118
Carbonate of Lime	- 2·0000	0·1407
Carbonate of Magnesia	- 2·0000	0·7887
Carbonate of Lithion	- - -	0·0167
Sulphate of Potass -	- - -	0·5925
Sulphate of Soda -	- 1·0000	0·1213
Muriate of Lime -	- 0·5000	
Muriate of Magnesia	- 0·2800	
Muriate of Soda -	- 3·0000	7·7974
Carbonate of Manganese	- 0·1250	0·0037
Carbonate of Iron -	- 0·0625	0·0164
Fluate of Lime -	- - -	0·0019
Silex - - -	- - -	0·4139
Earthy Phosphate	- - -	0·0018
Carbonate of Barytes	- - -	0·0020
Carbonate of Strontian	- - -	0·0107
	<hr/>	<hr/>
Grains -	28·9375	19·6194
	<hr/>	<hr/>



## SCHLANGENBAD,

So termed from the number of small harmless snakes in its neighbourhood, is situate three German miles from Wisbaden, and one from Schwalbach, in a secluded and narrow valley, shut in by woody hills. The springs are said to have been discovered more than 200 years ago, by a herdsman tracing a sick heifer which strayed daily from the flock to them, and recovered its health. They have, however, never been much resorted to, although many flasks of the water are annually exported to various parts. Till within the last five years there existed only one large bathing and lodging house; but an additional building, the Neubad, has recently been constructed; and during the season of 1833 more than 300 persons used the baths. There are several agreeable promenades in the environs, and the finest part of the Rhingau is not distant. Those who dislike walking hire donkeys for excursions among the mountains.

The three springs lie behind the bathing-house,

and have a temperature of  $22^{\circ}$  R. The water is clear, without smell, of a slight saline taste, and a soft unctuous feel, which probably depends upon the animal matter which it contains. It bears an analogy to the Ems water; but differs from it in containing a much smaller proportion of carbonic acid gas and solid substance, there being not more than six grains to the pint; four and a half of carbonate of soda, and half a grain of muriate of lime. It is mostly used for baths, douches, and injections; that which is exported is chiefly used as a cosmetic. The sediment deposited from the water is also employed in ulcers, wounds, and some other local affections.

Baths of this water have a sedative effect on the nervous system, improve the cutaneous functions, and impart to the skin softness and clearness. They are principally useful in nervous affections, with increased irritation, as in the different forms of spasmodic action, and neuralgia; and are sometimes employed in these cases preparatory to a course of other waters; in ulcers and diseases of the skin of the dry scaly kind, or eruptions about the face. Where, however, these affections are complicated with a

cachectic state of the system, strumous disease, or a materially deranged state of the digestive organs, other remedies should be resorted to. They are also serviceable in some cases of chronic thoracic disease, in affections of the uterine system, irregular and painful menstruation, and in some diseases of the urinary organs. There is at Schlangenbad, Wisbaden, and many other places, a reservoir of water, or bath, for diseased animals.

## BILIN.

Bilin is situate between Teplitz and Prague, not far from the former town, in a pleasant valley, watered by the Bila, and contains about 1500 inhabitants. It possesses four mineral springs, which are perhaps the richest of their class in carbonate of soda; this salt being in the proportion of seventy grains to the pint. The water of the Josephs-quelle and the Carolinenquelle are most used for exportation; Bilin itself not being much resorted to. It is clear, very sparkling, of a sharp, saline, rather agreeable taste, and has 9 degrees of temperature. It is sometimes aperient, but

more frequently diuretic; altering the secretions, stimulating the lymphatic glandular system, and promoting absorption; and is more especially adapted to chronic affections of the urinary organs with secretion of mucus; cases of stone; chronic bronchitis, particularly cough, attended with abundant expectoration in old people; humid asthma; debility of the digestive organs, with acidity and liver derangement.

*A Pint of Water from the Josephs-quelle contains, according to Reuss,*

			Grains.
Sulphate of Soda	-	-	- $14\frac{3}{10}$
Muriate of Soda	-	-	- $2\frac{1}{5}$
Carbonate of Soda	-	-	- $70\frac{1}{5}$
Carbonate of Lime	-	-	- $2\frac{2}{3}$
Carbonate of Magnesia	-	-	- $1\frac{1}{3}$
Silex	-	-	- $\frac{8}{15}$
Oxide of Iron	-	-	- A trace.
Carbonic Acid Gas $26\frac{2}{3}$ cubic inches.			

#### FACHINGEN,

In the duchy of Nassau, two German miles north of Wisbaden. The village lies on the left bank of the Lahn, in a romantic valley, enclosed by high woody hills. At the springs, which rise in a

meadow near the village, there is merely a building for bottling and packing the water for exportation; so that persons who prefer drinking it at the source, reside at Dietz, about a mile off, where the accommodation is tolerable. Upwards of 300,000 flasks have been exported within twelve months to various parts of Europe. These springs are classed among the strongest alkaline saline waters of Germany; their action resembles that of the Bilin water, though they are less rich in saline and gaseous substance; their temperature is also somewhat lower. They may be recommended in the same cases as the Bilin water, and are likewise said to be very beneficial in some cases of chronic gout, and nervous affections.

*A Pint of the Water contains, according to Bischof,*

			Grains.
Carbonate of Soda	-	-	43·2578
Sulphate of Soda	-	-	0·3836
Muriate of Soda	-	-	4·3119
Phosphate of Soda	-	-	0·0186
Carbonate of Lime	-	-	2·4965
Carbonate of Magnesia	-	-	1·7313
Carbonate of Iron	-	-	0·0892
Silex	-	-	0·0873
			<hr/>
			52·3762

Carbonic Acid Gas 19·6874 cubic inches.

## VICHY.

This small town is built on the banks of the Allier, eighty-seven leagues from Paris, and fifteen from Moulins, in an extensive valley, bounded on all sides by hills, rising in the form of an amphitheatre, and richly covered with fruit-trees and vineyards. The roads in the neighbourhood are good, the views beautiful, the air extremely pure and temperate ; and all the conveniences of life are to be found in that part of the town adjoining the baths, which is separated from the old town by a handsome promenade, opposite to which stands the thermal establishment, built in 1787, and surrounded by elegant hotels. These advantages, and the high reputation enjoyed by the mineral springs, concur in rendering Vichy one of the most frequented watering-places in France.

The springs of Vichy were used by the Romans; remains of piscinæ, of marble baths, medals of Nero, and other antiquities, were found at the time the ground was cleared for the construction of the new establishment.

Their number amounts to seven, viz.—

			Temperature. Reaumur.
La Grande Grille	-	-	32° to 34°
Le Puits Chomel	-	-	32°
Le Grand Bassin	-	-	35°
Le Petit Boulet, ou Acacias	-	-	24°
Le Gros Boulet, ou de l'Hôpital	-	-	28°
La Source Lucas	-	-	25°
Les Célestins	-	-	18°

All these springs belong to the establishment, which comprises four vast court yards, surrounded by bathing cabinets, and having in the centre reservoirs of water. On the first floor of the edifice are the assembly rooms.

The water of Vichy is limpid, without smell, of an acidulous, alkaline taste, not unlike that of soda water. It contains a large proportion of free carbonic acid, which is most abundant in the Fountain des Acacias (twenty-three cubic inches to the pint). Next to this spring, Lucas, Les Célestins, and Le Grand Bassin, are the richest in this respect. Carbonate of soda, and carbonic acid gas are the predominating ingredients of Vichy water: this salt is extremely plentiful in the Célestins, which contains ninety-six grains to the pint; the Lucas likewise contains a large quan-

tity. Iron is also found in these springs; the Acacias contains half a grain to the pint, and might be ranked among the chalybeate springs, were it less rich in saline substance.

The operation of these waters is alterative, laxative, and diuretic, without being aperient or diaphoretic: it affects most perceptibly the secretion of urine, increasing its quantity, and altering its quality, so as, according to M. D'Arcel, to render alkaline the urine of a person after having drank three or four glasses, or taken a bath: hence it is highly useful in some diseases of the urinary organs, especially stone, and the disposition to the formation of lithic acid, or what is commonly called red gravel. The water is also much used, both at the springs and throughout France, in those deranged states of the digestive functions which are termed abdominal engorgement or obstruction; in chronic enlargement of the liver or spleen; long standing stomach disorder, with acidity; hemorrhoidal affections; and uterine derangement. It has but little effect on scrofula, most diseases of the skin, and rheumatism, and often aggravates gout. Its use should be pro-



hibited to plethoric, or highly irritable persons, to those of rigid fibre, in nervous diseases and affections of the chest.

Most patients only drink the water; beginning by the spring Les Célestins, which is the coolest and pleasantest to the taste, they subsequently use the water of the Grande Grille, or Acacias. The Grande Grille has a high reputation in cases of abdominal obstruction. The water of the Grand Bassin, or of the Hôpital, is mostly used for baths, diluted with an equal part of river water, which gives a proper temperature to the bath, and prevents the rapid escape of the carbonic acid.

The season at Vichy commences about the middle of May, and terminates in the middle of September. About 800 strangers can find good accommodation at the same time.

*According to Longchamp's Analysis, Two Pints of Water yielded,*

Free Carbonic Acid	-	17 cubic inches.
Bi-carbonate of Soda	-	90 grains.
Muriate of Soda -	-	10 —
Sulphate of Soda -	-	8 —

with small quantities of lime, magnesia, silix, traces of iron, and of a vegeto-animal substance.

M. Mossier's analysis gives the following, as the amount of solid substance contained in a gallon of water from each spring:—

	Grande Grille. Grains.	Grand Bassin. Grains.	Chomel. Grains.
Carbonate of Lime	- 14.91	15.74	21.29
Carbonate of Magnesia	- 2.78	2.78	2.78
Carbonate of Iron	- 0.74	1.39	a trace.
Carbonate of Soda	- 320.46	300.00	336.11
Sulphate of Soda	- 51.57	63.98	65.28
Muriate of Soda -	- 21.17	35.93	24.44
	<hr/> 411.63 <hr/>	<hr/> 419.82 <hr/>	<hr/> 449.90 <hr/>

	Grand Boulet. Grains.	Petit Boulet. Grains.	Lucas. Grains.
Carbonate of Lime	- 22.68	30.46	31.57
Carbonate of Magnesia	- 2.50	3.24	3.79
Carbonate of Iron	- 3.33	3.24	1.57
Carbonate of Soda	- 310.37	395.37	264.44
Sulphate of Soda	- 58.05	28.12	60.09
Muriate of Soda -	- 10.18	4.35	67.68
	<hr/> 407.11 <hr/>	<hr/> 464.78 <hr/>	<hr/> 429.14 <hr/>

#### MONT D'OR,

A village situate in the valley at the foot of Mount Angle. The name is derived from the neighbouring chain of mountains, the tops of which are covered with snow more than half the

year. From the position and elevation of Mont d'Or, the climate, even in summer, is often cold and variable; and storms frequently occur. Nor does the place offer much resource for amusement, although there are some agreeable walks and drives in the environs. It is, however, from the high character of its springs, a good deal frequented in the season, viz. from the middle of June to the beginning of October. A few years ago were discovered an ancient temple, Roman baths, fragments of statues, and other remains, proving the high antiquity of the mineral springs. These are seven in number, viz. : —

	Temperature. Reaumur.
La Source de César, ou la Grotte	- 33°
Caroline -	- 36°
Grand Bain, ou le Pavillon	33°
Ramond -	- 33°
Rigny -	- 33°
Madeleine -	- 34°
Sainte-Marguerite	- 10°

The water of these springs is colourless and inodorous, of a slightly saline taste, and emits bubbles of carbonic acid gas; the quantity of which is so great in stormy weather, that the

entrance to some of the baths is prohibited, from an apprehension of persons being asphyxied. Three springs, viz. César, Caroline, and Le Pavillon, supply the twenty-five bathing cabinets, the douches, and the piscinæ of the thermal establishment. They are also used for drinking, in chronic disorders of the digestive functions; chronic rheumatism; pectoral complaints without inflammatory complication; and humid asthma; in these latter complaints the spring La Madeleine is mostly preferred. The water is not well adapted to cases of scrofula or gout, as its properties are too exciting. Many persons cannot remain in this bath more than four or five minutes; it is usual, however, to dilute the water for bathing with water of a lower temperature and less saturated with saline substance. The spring St. Marguerite answers this purpose very well; its water, mixed with wine, forms an agreeable beverage.

*M. Bertrand's Analysis of a Gallon of Water from the Pavillon Spring.*

			Grains.
Carbonate of Soda	-	-	35·00
Muriate of Soda		-	25·72
Sulphate of Soda	-	-	8·50

			Grains.
Carbonate of Lime	-	-	24·15
Carbonate of Magnesia	-	-	8·22
Protoxide of Iron	-	-	0·70
Alumina	-	-	6·82
Silex	-	-	5·25
			<hr/> 114·36

Carbonic Acid Gas 23·95 cubic inches.

## ST. NECTAIRE.

This village lies only two leagues distant from Mont d'Or, at the foot of the mountains of that name. Its hot springs were known to the Romans, several remains having been discovered by accident about thirty years ago; previous to which period they were but little used. The principal ones are Le Gros-Bouillon, 31°. R.; La Vielle Source, 31°.; La Voute, 20°.; Pauline, 28°.; Du Chemin, 20°.; Du Rocher, 31°.; and La Côte. They are all alike in chemical composition, containing a large quantity of carbonic acid gas, carbonate and muriate of soda, and are more employed for bathing and douching than internally; in cases of rheumatism, paralysis, and catarrhal affections. Some diseases of the urinary

organs, dyspeptic complaints, amenorrhea, and some other uterine disorders, are also frequently relieved by their internal exhibition.

*M. Bertrand's Analysis of a Gallon of Water.*

			Grains.
Bi-carbonate of Soda	-	-	198·30
Muriate of Soda	-	-	169·40
Sulphate of Soda	-	-	10·91
Carbonate of Lime	-	-	30·80
Carbonate of Magnesia	-	-	16·80
Silex	-	-	7·00
Protoxide of Iron	-	-	0·98
			<hr/> 434·19

Carbonic Acid Gas 108·51 cubic inches.

NERIS.

The hamlet of Nérís is situate on the high road from Moulins to Limoges, eighty leagues from Paris. Its position is extremely agreeable and healthy, epidemic diseases being never known to prevail. Nérís must have been a place of some importance in the time of the Romans, the remains of an amphitheatre, and other buildings having been discovered. At present, however, it consists of about eighty houses, with a population

of 1000 inhabitants. Before the erection of the thermal establishment in 1820, Nérís was but little resorted to : the building contains sixty bathing cabinets with douches, four piscinæ and vapour baths.

There are four springs, viz. Le Puits de la Croix ; Le Grand Puits ; Le Puits Carré, ou Temperé ; and La Source Nouvelle, which was discovered in 1757, at the time of the earthquake at Lisbon. The Puits Carré is a cool spring from 15° to 17° R. The temperature of the other springs ranges between 29° and 42°.

The water is clear, inodorous, and tasteless, and has an unctuous feel ; it contains carbonic acid gas, carbonate, sulphate, and muriate of soda, silex, and animal matter, to which its oleaginous property is probably owing. In chemical composition, proportion of saline matter, and temperature, it resembles the water of Schlangenbad, and may be used in cases where the stronger waters would be inadmissible. Alibert recommends a course of these waters in nervous disorders, diseases of the skin, where a sedative operation is required ; in chronic pulmonary affections, pas-

sive hemorrhages, glandular tumours, paralysis, and chronic irritation of the bladder, or uterus. The temperature of the bath should be between  $30^{\circ}$  and  $36^{\circ}$ ; it is usual to go to bed after the bath, in order to promote the cutaneous transpiration. Many of the houses have baths, to which the water is conducted from the springs through pipes. Mud baths are also used in some cases, especially in articular rheumatism, and obstinate cutaneous diseases.

The season begins in May and terminates in October.

#### CHAUDES-AIGUES,

In the department of Cantal in Auvergne. These mineral springs were formerly in high repute, under the name of Calentes Baiæ. The principal ones are Les Sources du Parc,  $64^{\circ}$ . R.; Du Bain,  $56^{\circ}$ .; De la Bonde,  $59^{\circ}$ .; and Felgère,  $58^{\circ}$ . The first rises in the centre of the town, furnishes the largest quantity of water, and is employed for warming houses and other domestic purposes. The water is clear, almost tasteless, and leaves a



yellow ochrey deposit on the stones over which it flows. All the springs are of the same chemical composition, and contain but a small proportion of saline substance. Taken internally the water is slightly aperient; used in the form of bath, it is very serviceable in neuralgic pains, swellings and pains of the joints of a rheumatic nature; in paralysis, and some cutaneous diseases. These springs are, however, much neglected, and but little resorted to at present.

## WILDBAD,

A small town of Wurtemberg, in the circle of the Black Forest, lying in a deep romantic valley, enclosed by high rocks, five German miles from Stuttgard, and three from Baden-Baden. The market-place is handsome, and adorned with a fountain. In the new building for the residence of the royal family are the public assembly rooms. Wildbad is a good deal frequented in the season, principally by persons from the towns of Wurtemberg and the duchy of Baden.

The environs abound in delightful walks and rides.

There are three different buildings for bathing : the first, for the male sex, comprises the Fürstenbad, for the royal family ; the Herrenbad, for persons of condition, and the *Gemeine Männerbad*, for the inferior classes. The second comprises the Früenbad, or ladies' bath, and the Weiberbad, or women's bath. The third is termed the Neubad, and is used by the higher classes. Persons bathe together, as at Leuk and some other Swiss baths. The temperature of the springs is from 25° to 30°. R.

The water is said to be very efficacious in chronic, gouty, and rheumatic cases, neuralgic pains in the limbs, paralysis, diseases of the skin, and obstinate ulcers, stiffness of joints, stomach and liver derangement, hypochondriasis, nervous and convulsive affections. Females of a nervous irritable habit, who would be unable to bear the action of stronger mineral waters, often derive great advantage from those of Wildbad. The water is also used for drinking.

According to Staudenmeyer, a pint of the water does not contain more than one grain of solid substance, which consists of the salts of soda and lime. The proportion of carbonic acid gas is also very small.

## ACIDULOUS SPRINGS.

UNDER this head many writers on mineral waters place all those springs which contain a large proportion of free carbonic acid. In a great many of such springs, however, the nature and proportion of the solid parts determine their operation, although some of them contain more carbonic acid than several acidulous springs. Many of these have been considered under the preceding divisions; and it now remains to notice the more strictly acidulous waters, which are characterised by the predominating action of the carbonic acid, over that of the other ingredients. They are, for the most part, cold, very sparkling, and effervescing, without smell, of a sharp, piquant, agreeable taste, and soon lose their properties by exposure to the atmosphere. Their operation is cooling, refreshing, and at the same time exhilarating, altering the quality of the secretions of the alimentary canal and kidneys, and increasing their quantity. These waters are very commonly taken either pure or mixed with wine, as an ordinary

beverage, and are not unfrequently exhibited in febrile and inflammatory complaints. They sometimes, however, prove too exciting, producing headache, heaviness, confusion of ideas, with general agitation and sleeplessness; but in general are highly useful in many cases of dyspepsia, nervous affections, with the character of relaxation or torpor; pulmonary complaints, and diseases of the urinary organs. The Seltzer water is, perhaps, the best and most familiar specimen of the whole class.

## SELTERS,

Or Nieder-Selters, a village, containing about a thousand inhabitants, in the duchy of Nassau, not far from Limburg. It is but little resorted to for the purpose of drinking the water, of which the spring yields 1,440,000 cubic inches daily. Its temperature is 12° R. Upon a moderate calculation five and twenty persons are constantly employed in filling, corking, and packing the bottles for exportation to various parts of the world. The saline parts, which consist principally of muriate and carbonate of soda and carbonate of lime, are intimately combined with the carbonic acid; on which account the water keeps long, and is not speedily decomposed even by exposure to the atmosphere for a short period.

The action of this water is antiphlogistic, cooling, and exhilarating; promoting the secretions from the alimentary canal, kidneys, and skin; increasing the activity of the lymphatic, glandular, and absorbent system: hence it is useful in many complaints, particularly in plethoric states of the

system; some inflammatory and febrile affections; stomach derangement with acidity and hypochondriasis; renal and calculous diseases, vesical catarrh; bronchial irritation with copious secretion; liver obstruction with gall-stones or piles.

According to the analysis of Bischoff, sixteen ounces of water contain —

		Grains.
Carbonate of Soda	-	15·4093
Sulphate of Soda	-	0·5653
Muriate of Soda	- -	16·2855
Phosphate of Soda	- -	0·7233
Carbonate of Lime	-	1·8672
Carbonate of Magnesia	-	1·5953
Iron, Manganese, and Earthy Matter		0·1512
Silex	- - -	0·2892
		<hr/> 36·8893

Carbonic Acid Gas 15·5714 cubic inches.

#### LIEBWERDA,

A village in Bohemia, near the frontier of Silesia, one and a half German miles from Flinsberg, and the same distance from Friedland. It is a good deal frequented in the season. The

lodging-houses are commodious; the price of apartments being regulated by a public tariff. The bathing-house is handsome, well organised, and contains a large saloon where the concerts and public balls are held. There is also a theatre, and a handsome château belonging to the Count Klam-Gallas, where musical entertainments are sometimes given. The promenades and environs are extremely agreeable. Among the interesting objects in the neighbourhood are the Convent of Haindorf, Raspenau, Mildenau, the Cascade of Weisbach, and the Castle of Friedland.

Liebwerda possesses four springs, all rich in free carbonic acid, and containing but a small proportion of saline substance. They are termed the Trinkquelle, the Josephinenquelle, the Stahlbrunnen, and the Wilhelmsbrunnen. Their temperature is 9°. The two last contain iron in the proportion of about half a grain to the pint, and are consequently more exciting and tonic than the others. These springs are said to be very beneficial in cases of nervous debility, stomach and liver disorder, chlorosis, incipient phthisis, chronic bronchitis, and gouty and rheumatic affec-



tions. The Trinkquelle, or Christiansquelle, is principally for drinking, the other springs are mostly used for bathing.

Reuss found in sixteen ounces of the Trinkquelle —

Muriate of Soda	-	-	-	Grains.
Sulphate of Soda	-	-	-	0·027
Sulphate of Lime	-	-	-	0·166
Carbonate of Soda	-	-	-	0·151
Carbonate of Lime	-	-	-	0·364
Carbonate of Magnesia	-	-	-	0·066
Oxide of Iron	-	-	-	0·222
Extractive Matter	-	-	-	a trace
				0·055
				<hr/> 3·051

Carbonic Acid Gas 23·040 cubic inches.

#### GEILNAU,

In the duchy of Nassau, two leagues from Fachingen, and five from Ems, is situate in a beautiful and romantic part of the valley of the Lahn. Its mineral spring was in great request in former times, but from some cause fell into oblivion, whence it has been rescued within the last twenty years. A good deal of the water is exported. It is clear, sparkling, and effervescing;

of a piquant acidulous taste; contains a large proportion of saline substance, with some iron, and is strongly impregnated with carbonic acid gas. The temperature is 8°. Its advantages are said to be very great in cases of stomach derangement, obstructed abdominal circulation with piles, chronic bronchial disease, and in stone or gravel.

According to Amburger, sixteen ounces contain —

			Grains.
Carbonate of Soda	-	-	- 12·00
Carbonate of Iron		-	- 0·83
Carbonate of Lime	-	-	- 1·50
Muriate of Soda	-	-	- 0·33
Sulphate of Magnesia	-	-	- 3·66
Earthy Extractive	-	-	- 1·50
Aqueous Extractive	-	-	- 0·50
			<hr/>
			20·32

Carbonic Acid Gas 19·5 cubic inches.

#### ALTWASSER,

A village in the circle of Waldenberg, in Silesia, containing several good lodging-houses, a château, two bathing-houses, and a public building, termed the Gallery, for assemblies. Its mineral springs have been used since the middle

of the seventeenth century, more so, however, within the last thirty years. The principal ones are termed the Ober-brunnen, the Mittel-brunnen, the Friedrich's-brunnen, and the Bade-quelle. They have a temperature ranging from  $42^{\circ}$  to  $47^{\circ}$  Fahrenheit. The three first are principally used for drinking; the last for bathing. Persons bathe together at Altwasser; the bathers being divided into three classes, according to the price they can afford to pay. A full course comprises from twenty-eight to thirty-six baths.

The water does not contain much solid substance, but is rich in carbonic acid gas, and resembles that of Liebwerda: the iron which it holds in solution, though in very small quantity, imparts to it a tonic property, which is serviceable in cases of stomach debility and nervous diseases. It is also used after other mineral water, on account of its tonic effects.

*Menzel's Analysis of Sixteen Ounces of Water from the Friedrich's-brunnen.*

			Grains.
Carbonate of Soda	-	-	$6\frac{1}{225}$
Muriate of Soda	-	-	$\frac{12}{125}$
Carbonate of Lime	-	-	$3\frac{13}{100}$

Carbonate of Magnesia	-	-	$1\frac{4\frac{3}{5}}{125}$
Silex	-	-	$\frac{2}{25}$
Earthy Matter	-	-	$\frac{3}{20}$
Oxide of Iron	-	-	$\frac{3}{25}$
Carbonic Acid Gas $21\frac{3}{5}$ cubic inches.			

## SALZBRUNN,

A large village, scarcely a league distant from Altwasser, and nine German miles from Breslau. Its position is agreeable, and the accommodation is very good, having been much improved of late years. Living is very cheap here, as at most places in the centre and south of Germany. Persons who use the waters are divided into several classes:—those of the first class pay each half a rixdollar per week for the use of the water, and for a ticket of entrance to the promenades and music, which is retained during the whole period of treatment. Near the drinking spring is a gallery 200 feet long, for walking exercise in bad weather.

Three springs are principally used for drinking; the Oberbrunn, the Muhlbrunn and the Heinrichsbrunn: the water of the latter is exported in con-

siderable quantity. The other springs which supply the bathing-houses are the Heilbrunn, Kramerbad, Wiesenbad, and Stahlbad.

The water resembles that of Selters, being resolvent, cooling, aperient, and diuretic: it is much used in chronic pulmonary affections, asthma, incipient phthisis, diseases of the digestive and urinary organs, hysterical and other nervous affections. The number of visitors in the season of 1832 amounted to 1312.

*Mogalla and Günther's Analysis of Sixteen Ounces of Water.*

			Grains.
Sulphate of Soda	-	-	- $2\frac{4}{5}$
Muriate of Soda	-	-	- $1\frac{1}{5}$
Carbonate of Soda	-	-	- $7\frac{7}{10}$
Carbonate of Lime	-	-	- $1\frac{1}{4}$
Carbonate of Magnesia	-	-	- $1\frac{1}{25}$
Carbonic Acid Gas $16\frac{9}{10}$ cubic inches.			

REINERZ

Is also a large village, or rather a small town, in Silesia, three German miles from Glatz. The principal buildings at the springs, which lie about a mile distant from the town, are the Deutsche Haus, where are found every requisite for douches

and shower-baths; the Gesellschaftshaus, with dining, assembly, and play rooms. The Traiteur-haus, or restaurateurs, and the Tempelhaus. There are several agreeable promenades and objects of interest in the neighbourhood.

The principal springs are the tepid drinking spring, the cold spring, and the three bathing springs: the temperature of the first is  $14^{\circ}$  R.; that of the second  $9^{\circ}$ . They do not materially differ in chemical composition, though the cold spring is rather more gaseous: both contain iron, and have, on that account, been compared to the waters of Franzensbrunn. From 5 to 700 persons, chiefly Germans and Poles, use these springs every year.

According to Mogalla and Günther's analysis, sixteen ounces from the tepid spring contain —

Sulphate of Soda	-	-	Grains. 2·027
Muriate of Soda	-	-	0·560
Carbonate of Soda	-	-	13·850
Carbonate of Lime	-	-	5·200
Carbonate of Magnesia	}	-	1·340
Carbonate of Iron			
			<hr/> 22·977

Carbonic Acid Gas 20.280 cubic inches.

## ALEXANDERBAD,

So called from the Margrave Alexander of Baireuth, who brought the spring into notice, and built most of the edifices near it. It is situate in a beautiful and picturesque country, four German miles from Eger, and six from Baireuth. The principal building is handsome and commodious; it contains an assembly room, and forty-three apartments for visitors. Another building contains nine apartments, and the large wooden building (Blockgebaude) has twenty-two. The mode of living is cheap, sociable, and agreeable; the neighbourhood abounds in delightful promenades; the hills in the valley are easy of ascent, and present from their summits a variety of pleasing views. Louisenbourg, with its romantic beauties, attracts most frequently the attention of strangers; and from the Bourgstein a delightful and extensive prospect may be enjoyed. Numerous other interesting objects lie in the environs, and render a few weeks' sojourn at Alexanderbad extremely agreeable; carriages and horses may be hired for excursions.

The spring is very rich in carbonic acid gas, but contains a small proportion of saline substance. Taken pure, or mixed with sugar or wine, it forms a cooling, agreeable beverage, and may be employed medicinally in cases of increased secretion from the mucous membranes; as pulmonary catarrh, stomach derangement, diarrhoea, and leucorrhœa. It is often used as an after-cure to a course of Carlsbad water. Several thousand flasks are annually exported.

Sixteen ounces contain, according to Vogel —

	Grains.
Sulphate of Soda - - -	- 0·10
Carbonate of Soda - - -	- 0·30
Muriate of Soda - - -	- 0·20
Carbonate of Magnesia - -	- 0·25
Carbonate of Lime - - -	- 1·12
Carbonate of Iron - - -	- 0·28
Silex - - - - -	- 0·25
	<hr/>
	2·50

Carbonic Acid Gas 28·2 cubic inches.

#### FIDERIS.

The village of Fideris, in the canton of the Grisons, lies in a wild romantic valley, surrounded



by pine forests. The bath is about a mile distant from the village, and possesses two bathing houses joined together by a long gallery. On the ground floor are the baths: the upper part of the building is distributed in apartments sufficient to lodge 100 visitors. The springs are the strongest alkaline acidulous waters of Switzerland: they are used both for drinking and bathing in the months of July, August, and September. According to Capeller's analysis, a pint of the water contains fifteen grains of carbonate of soda; a small quantity of muriate and sulphate of soda; carbonate of lime and iron; and twenty-seven cubic inches of carbonic acid gas. Fideris is, for the most part, frequented by Swiss; and presents no particular advantage over other springs of the same class.

#### GODESBERG,

A village in Rhenish Prussia, on the left bank of the Rhine, one German mile from Bonn, possesses in its immediate neighbourhood a very efficacious acidulous chalybeate spring, formerly

known by the name of the Draitsch-water. This spring was first brought into notice in 1789, by the Elector Maximilian, who caused it to be enclosed, erected buildings, and formed promenades near it. Besides two large hotels, there is also a Redoute, containing rooms for balls and play, where visitors may be lodged. The walks and drives at Godesberg are delightful and varied. The ruins of the old castle, which are among the first to attract the traveller's attention in ascending the river, are but a few hundred feet from the village. Further on are Rolandseck, and the Isle of Nonnenwerth; while on the right bank, and nearly opposite, the Siebengebirge, whose highest summit is crowned by the ruined castle of Drachenfels, form the most majestic and striking feature in the scene.

The water contains a large quantity of alkaline salts, and carbonic acid gas; it has a manifest tonic property, and may be used with advantage in cases of debility of the mucous membranes with increased secretion; as stomach disorder, chronic bronchitis, calculous diseases, and vesical catarrh; hypochondriasis, leucorrhea, menorrhagia,

and dysmenorrhœa. It is used both for drinking and bathing: when drank, it is not unusual to combine it with asses' or cows' milk, as is also very commonly done at Geilnau, Salzbrunn, and Alexanderbad.

According to the analysis of Wüzzer, sixteen ounces contain —

			Grains.
Muriate of Soda	-	-	- $1\frac{1}{3}$
Carbonate of Soda		-	- 7
Carbonate of Lime	-	-	- $2\frac{2}{3}$
Carbonate of Magnesia		-	- $3\frac{6}{10}$
Carbonate of Iron	-	-	- $\frac{3}{4}$
Carbonic Acid Gas 16 cubic inches.			

## PYRMONT.

In addition to its other mineral waters, Pyrmont has the advantage of possessing an acidulous spring, which is principally employed for drinking, and also for exportation, though not to the same extent as the chalybeate water. Its temperature is 8°. The water is rich in free carbonic acid, but does not contain much saline substance. It is used either in conjunction with, or subsequent to, the employment of other springs, and is

one of the best that can be taken in cases where a strictly acidulous water is indicated.

According to Brandes and Krüger, a pint of water yields of crystallised substance —

		Grains.
Bi-carbonate of Soda	-	0·3062
Sulphate of Soda	-	0·3782
Muriate of Soda	-	0·0118
Sulphate of Magnesia	-	0·6030
Muriate of Magnesia	-	0·1262
Carbonate of Magnesia	-	0·0684
Sulphate of Lime	-	0·3256
Carbonate of Lime	-	1·8110
Earthy Matter	-	0·0080
		<hr/>
		3·7284

Carbonic Acid Gas 27·49 cubic inches.

#### KISSINGEN.

The Mabrunnen at Kissingen is one of the best alkaline acidulous springs, and in its composition resembles that of Selters, with the exception that it does not contain any iron ; a circumstance which renders it less exciting, and more applicable to plethoric individuals, febrile, and sub-inflammatory conditions of the system. It is cooling and diuretic, and may be used in all cases where acidu-

lous waters are indicated. In stone and gravel cases, disease of the kidneys and bladder, pulmonary and scrofulous affections, it is said to have great efficacy. It is also used in some cases at the same time as the other springs at Kissingen.

A pint contains, according to Kästner —

			Grains.
Muriate of Soda	-	-	- 18·25
Muriate of Lime	-	-	- 3·05
Muriate of Potass	-	-	- 1·02
Sulphate of Soda	-	-	- 1·85
Sulphate of Lime		-	- 0·77
Carbonate of Lime	-	-	- 2·70
Carbonate of Magnesia	-		- 1·82
Carbonate of Soda	-	-	- 0·35
Silex	-	-	- 0·47
Phosphate of Soda	-	-	- 0·12
Carbonic Acid Gas 30·24 cubic inches.			

#### DINKHOLD,

In the duchy of Nassau, is situate near the junction of the Lahn with the Rhine, about a mile from the small town of Brauchen, in an extremely agreeable country. This mineral spring has been known upwards of 300 years, and is one of the richest in Germany in carbonic acid gas. It may

be used with advantage in most of the cases which have been already named, where a purely acidulous water is required.

*Klipstein's Analysis of a Pint of Water.*

			Grains.
Sulphate of Soda	-	-	- 1·800
Muriate of Soda		-	- 1·320
Carbonate of Soda	-	-	- 2·240
Sulphate of Lime	-		- 0·770
Carbonate of Lime	-	-	- 4·270
Sulphate of Magnesia		-	- 0·930
Silex -	-	-	- 0·820
Extractive	-	-	- 0·100
			<hr/> 12·250

Carbonic Acid Gas 31·201 cubic inches.

## APPENDIX.

---

### ENGLISH MINERAL SPRINGS.

UNDER this head I purpose saying a few words respecting some of the principal mineral waters of England, without, however, entering into any detailed account, which would alone suffice to fill a volume, and for which I beg to refer to Sir C. Scudamore's Treatise, as the best extant ; but principally with the view of instituting a comparison between their composition and that of the continental springs which they most resemble, in order that the reader may be enabled to form an opinion with regard to their relative efficacy.

England possesses many valuable sulphurous, chalybeate, and saline springs, which, however, are in general less rich in mineral substances than the principal continental ones. None of the English springs can be said to belong to the class of acidulous waters, and in the great majority the proportion of volatile parts is extremely small. Most of them are cold, the

number of warm ones being very limited; and even among these the temperature in very few instances exceeds  $80^{\circ}$  of Fahrenheit. The Hot Well at Bath is the warmest, its temperature being  $117^{\circ}$ . The temperature of the Clifton spring is  $74^{\circ}$ ; that of the Mattock water is still lower.

Of the sulphurous springs, those of Harrowgate are the most important. Six are now used, viz., the Old Sulphur Well, Thackwray's Spring, the Crescent New Spring, the Crescent House Spring, the Knaresborough and Hospital Springs. The Old Sulphur Well is used for drinking, and the water is exported to various parts of England. It emits but few bubbles; has a strong sulphurous smell and taste, which it loses by exposure to the air: its temperature is  $54^{\circ}$  Fahrenheit. The following exhibits the saline and gaseous contents of a gallon of the water, analysed by Dr. A. Hunter.

Muriate of Soda	-	-	-	Grains.
				867
Muriate of Lime	-	-	-	87
Muriate of Magnesia	-	-	-	42.5
Bi-carbonate of Soda	-	-	-	20
				<hr/>
				1016.5
				<hr/>
Sulphuretted Hydrogen Gas	-	-	-	Cubic Inches.
				15.64
Carbonic Acid Gas	-	-	-	2.72
Carburetted Hydrogen	-	-	-	6.80
Azote	-	-	-	8.84
				<hr/>
				34.00
				<hr/>



The other springs have a similar composition, but are less rich in saline and gaseous substance. They are chiefly used for bathing.

The Harrowgate water does not resemble in its composition any of the Continental springs which have been noticed. It is richer in saline substance than the water of Aix-la-Chapelle, but not so strongly impregnated with sulphur: on this account, as well as from its lower temperature, its action is less energetic, and approaches nearer to that of Weilbach, or the weaker Pyrenean springs. It may, however, be used in all cases where sulphurous springs are indicated. Its efficacy is highly extolled in cutaneous diseases, especially of the scaly kind; in inactive states of the liver and abdominal circulation, with piles; diseases of the urinary organs, attended with the deposition of gravel; and chronic gouty or rheumatic affections.

The village of Moffat in Scotland possesses one of the most efficacious sulphurous springs in Britain, and is a good deal frequented by invalids. The water is, however, less rich in saline and gaseous substance than that of Harrowgate. According to Dr. Thompson, a gallon contains —

			Grains.
Muriate of Soda	-	-	- 176·569
Sulphate of Soda	-	-	- 16·562
Sulphate of Lime	-	-	- 11·579
Sulphate of Magnesia	-	-	- 5·474
			<hr/>
			210·184
Sulphuretted Hydrogen Gas 21·29 cubic inches.			

Among the English chalybeate waters, those of Tunbridge Wells may be considered to hold the first rank, and are of high antiquity. Only one spring is now in use; it has a temperature of 50° F., and contains but a small proportion of iron and carbonic acid gas when compared with the stronger springs of the Continent. As, however, the quantity of saline matter is very minute, it may be regarded as a pure chalybeate water. Its action is eminently tonic, not unfrequently inducing constipation of the bowels, which requires to be obviated by occasional aperients. According to Sir C. Scudamore's analysis, a gallon of the water contains the following solid and gaseous parts :

Muriate of Soda	-	-	-	Grains.
Sulphate of Soda	-	-	-	1.5
Muriate of Lime	-	-	-	1.786
Muriate of Magnesia	-	-	-	1.848
Carbonate of Lime	-	-	-	0.348
Protoxide of Iron	-	-	-	0.328
Manganese and Silex	-	-	-	2.748
				0.523
				<hr/> 9.068
				<hr/>
Carbonic Acid Gas	-	-	-	Cubic Inches.
Oxygen	-	-	-	9.66
Azote	-	-	-	0.60
				5.7
				<hr/> 15.96
				<hr/>

With respect to temperature, the quantity of iron and carbonic acid gas contained in the water, Tun-

bridge Wells appears to resemble Forges more than any other Continental spring. It will be seen, however, on comparing this table with the analyses of the chalybeate springs already described, that the amount of iron in the Tunbridge water falls infinitely short of the quantity contained in most others of the same class ; yet the tonic properties of this water are attested by experience, and afford an additional proof that the efficacy of a spring should not always be estimated by the mere consideration of its chemical composition. Sir C. Scudamore considers that the tonic property of this spring is, in some measure, due to the small proportion of its salts, which allows the iron to be more intimately combined with the carbonic acid gas. The same physician lays great stress upon the stomach being in a fit condition previous to a patient's commencing a course of this water, and recommends that some aperient medicine should be premised, which will, in great measure, prevent the occurrence of unpleasant sensations, which are experienced on first taking it ; such as flushing of the face, drowsiness, fulness of the head, and uneasy distension of the stomach with flatulence. In general, however, these symptoms are not of much importance, and subside spontaneously after a short time. Sir C. Scudamore extols the Tunbridge water in dyspepsia depending on debility of the stomach ; in uterine debility, chlorosis, dry scaly eruptions, some scrofulous and

calculous affections. To those desirous of detailed information on this spring, I beg to recommend the perusal of his work.

The chalybeate springs of Harrowgate contain less iron, but more saline matter, than that of Tunbridge Wells. They are six in number; viz. Oddy's, the Old Spa, the Tewit's Well, St. George's Well, Starbeck, and Oddy's saline chalybeate. The first five are pure chalybeate springs. According to Dr. Hunter's analysis, a gallon of water from the Oddy well contains —

Protoxide of Iron	-	-	-	Grains.
				1·8
Muriate of Soda	-	-	-	5·0
Sulphate of Soda	-	-	-	3·5
Muriate of Lime	-	-	-	6·0
Muriate of Magnesia	-	-	-	4·0
				<hr/>
				20·3
				<hr/>
Carbonic Acid Gas	-	-	-	Cubic Inches.
				5
Azote	-	-	-	8
Oxygen	-	-	-	1
				<hr/>
				14
				<hr/>

The other springs are less gaseous, and contain less saline matter. The Old Spa and Tewit's are more ferruginous, and resemble the Tunbridge spring; a gallon of water from each of these yields two grains of iron and eight of earthy salts. The St. George's and Starbeck contain less iron than the Oddy. The latter has, however, nearly as much salt, and is a good

deal used. The Tewit's and St. George's are now almost entirely neglected.

Oddy's saline chalybeate differs materially from the other spring, in containing more iron and a considerable quantity of salts. It appears from the analysis of Dr. A. Hunter, that a gallon of the water contains —

Carbonate of Iron	-	-	-	Grains.
Muriate of Soda	-	-	-	5·3
Muriate of Lime	-	-	-	576·5
Muriate of Magnesia	-	-	-	43·5
				9·65
				<hr/> 634·95
				<hr/>
Carbonic Acid Gas	-	-	-	Cubic Inches.
Azote	-	-	-	5·75
				7·75
				<hr/> 13·5
				<hr/>

This spring is, therefore, richer in salt than some of the strongest saline thermal springs of the Continent, as Wisbaden and Borcette: the quantity of iron is also more considerable than in most of the purely chalybeate springs of England; but its operation is, in great measure, neutralised by the amount of saline substance. The action of the water is, in fact, aperient or diuretic, and at the same time tonic; a circumstance which must prove of great advantage to many patients who would be unable to use the other springs without constantly having recourse to aperient medicines. This water is often taken after a course of

the sulphurous springs, and is highly serviceable in many cases of liver derangement, and debility of the stomach with constipation.

Brighton possesses one of the most powerful chalybeate springs in England, which appears to resemble that of Bruckenau more than any other on the Continent. The water of Bruckenau, however, contains more carbonic acid gas, and iron, which exists in the state of carbonate; whereas the Brighton water contains the sulphate. The following are the contents of a pint, according to the analysis of Mr. Daniell:—

Sulphate of Iron	-	-	-	Grains. 1·66
Sulphate of Lime	-	-	-	1·78
Muriate of Lime	-	-	-	1·71
Muriate of Magnesia	-	-	-	0·44
Muriate of Soda	-	-	-	1·36
				<hr/> 6·95

Carbonic Acid Gas 2 cubic inches.

This water is applicable to most cases where chalybeates are indicated. It is, however, more stimulant than that of Tunbridge Wells, and would probably be less suited to a delicate state of the digestive organs.

The saline thermal springs of England are few in number, and will hardly bear a comparison with those on the Continent with respect to their degree of heat and amount of solid or gaseous parts. The waters of Bath are the strongest, and are the only ones which can be termed hot; the temperature of the three

principal springs being — Hot-bath 117°, King's-bath 114°, Cross-bath 109°. These springs are near to each other, and, according to Mr. Philips, “may be considered as derived from one source, the temperature varying by their more or less circuitous passage to the surface.” The water is clear and colourless when first drawn. It does not emit bubbles of gas, and becomes decomposed on being exposed for some hours to the action of the atmosphere. Sir C. Scudamore observes that its taste is peculiar: when hot from the pump, it fills the mouth with a strong chalybeate impression, without any particular pungency, and accompanied with scarcely any kind of saline taste; as soon, however, as the water cools, the chalybeate taste is entirely lost, and nothing but the slightest saline sensation to the tongue remains. Sir Charles, on comparing his investigations with those of Mr. Phillips, considers that a pint of water from the King's-bath contains the following saline and gaseous constituents: —

		Grains.
Muriate of Lime	-	- 1·2
Muriate of Magnesia	-	- 1·6
Sulphate of Lime	-	- 9·5
Sulphate of Soda	-	- 0·9
Silica	-	- 0·2
Oxide of Iron	-	- 0·01985
Loss, partly by Carbonate of Soda	-	- 0·58015

---

 14

Carbonic Acid Gas 1·2 cubic inches.

On comparing this table with the analysis of the Ursprung at Baden-Baden, it will be seen that the Bath water approaches nearer to that spring in temperature, amount of saline and gaseous constituents, than to any other on the Continent. The springs of Baden-Baden, however, like other Continental saline thermal waters, contain a large proportion of muriate of soda; while in the Bath and other warm saline springs of England, the salts of lime predominate. It would appear, notwithstanding, that this circumstance does not prevent the applicability of both kinds of springs to the same cases. Dr. Falconer considered the Bath water to be eminently serviceable in many cases of visceral obstruction, gout, rheumatism, paralysis, chlorosis, hysteria, chorea, hypochondriasis, and lepra. Sir C. Scudamore, however, states that its employment in visceral obstructions and dyspepsia requires the most careful consideration, and recommends that the water should not be employed in complaints of the abdominal viscera while any absolute obstruction is actually existing; he considers that it is equally inadmissible where an active state of gouty diathesis exists, or where the tendency to relapse is strongly established in the constitution, but that more advantage is to be expected from it in the chronic form of the disease, "in which there is great deficiency of nervous energy in the muscles, joined with languid circulation in the extremities, and stiffness with aching pains in the



joints upon every motion." In chronic rheumatism the water used principally in the form of bath, with friction and pumping upon the part, is highly efficacious. As, however, the remarks I made when treating of other springs of this class apply equally to the Bath water, I need not repeat them here.

Buxton stands next in importance among the English warm springs. The principal spring, St. Anne's Well, is mostly employed for drinking; the others are used for baths. The water is clear, without taste or smell, and does not sparkle. Its temperature at the spring is 82° F., though in the basin it is not more than 77°. According to the analysis of Sir C. Scudamore and Mr. Gardner, a gallon contains—

Sulphate of Soda	-	-	-	Grains.
Muriate of Lime	-	-	-	0.76
Muriate of Soda	-	-	-	0.62
Muriate of Magnesia	-	-	-	2.16
Carbonate of Lime	-	-	-	0.70
Extractive	-	-	-	12.48
				1.44
				<hr/>
				18.16
				<hr/>
Carbonic Acid Gas	-	-	-	Cubic Inches.
Azote	-	-	-	1.8
				5.57
				<hr/>
				7.37
				<hr/>

The Buxton water appears to me to resemble in temperature and composition that of Wildbad more than any other on the Continent. It contains, how-

ever, more solid substance, of which there is not more than a grain to the pint in the Wildbad water. It is mostly used under the form of bath in cases of chronic rheumatism and gout.

Clifton also possesses one of the most celebrated warm springs in England, which is also known by the name of the Bristol Hot Well. In appearance and sensible properties, the water resembles that of Buxton; it is, however, more gaseous, a wine gallon containing, according to Dr. Carrick, thirty cubic inches of carbonic acid gas. The quantity of saline constituents is also larger.

The following table will exhibit the proportion of solid substance to the gallon:—

			Grains.
Muriate of Magnesia	-	-	- 7.25
Muriate of Lime	-	-	- 3.80
Sulphate of Lime	-	-	- 7.5
Sulphate of Soda	-	-	- 16.15
Carbonate of Lime	-	-	- 13.5
			<hr/>
			47.30
			<hr/>

The water has a temperature of 74°, and is used in the same kind of cases as Bath or Buxton water.

The waters of Matlock can hardly be said to belong to the division of warm springs, as their temperature does not exceed 66° or 68°. In sensible properties, they differ very little from common good spring water, and contain a very minute quantity of

saline substance. It is questionable whether they are much superior to common water in medicinal virtues.

The Cheltenham springs may be considered as the most important among the English saline aperient waters: the principal are those belonging to the original well, and to the Montpelier Spa. They are all rich in muriate and sulphate of soda, but contain a very small quantity of free carbonic acid: some of them possess a small portion of iron. The nature of their chemical constituents is the same in all; the relative proportions, however, vary a good deal in different springs. The following table exhibits the amount of salts contained in No. 4. of the old well, and No. 5. of the Montpelier Spa, according to Sir C. Scudamore's analysis:—

<i>Water a Pint.</i>		
	Old Well, No. 4.	Montpelier Spa, No. 5.
	Grains.	Grains.
Muriate of Soda	- 47·80	23·50
Muriate of Lime	- 4·29	4·92
Muriate of Magnesia	- 7·30	3·61
Sulphate of Soda	- 59·20	38·80
	<hr/>	<hr/>
	111·59	70·83
Carbonate of Iron a minute portion.		Iron a small portion.

These springs are not unlike those of Seidlitz and Saischütz, though containing less aperient salt. A pint of Seidlitz water contains 104 grains of sulphate of magnesia; the same quantity of Saischütz water holds in solution 128 grains of the sulphates of mag-

nesia, soda, and potass. The Cheltenham water has, however, the advantage of being less debilitating in its action, and can consequently be taken for several weeks in succession without inconvenience. Some of the Cheltenham springs resemble in temperature, as also in the nature and amount of saline constituents, the saline springs of Marienbad and the Salzquelle at Franzensbrunn. They do not, however, like these, contain free carbonic acid, a circumstance which must materially influence their operation, and render them better suited to persons who would be unable to support the action of a water strongly impregnated with carbonic acid. Gouty patients of a plethoric or irritable habit; those labouring under functional derangement of the liver and digestive powers induced by free living, or by long residence in unhealthy climates, would be likely to derive more advantage from a course of Cheltenham water than from the more gaseous springs.

Leamington possesses several saline springs which bear a great analogy to those of Cheltenham, though they are more gaseous. Lord Aylesford's spring, which is the most rich in aperient salts, closely resembles in the proportion of sulphate and muriate of soda No. 5. of Montpellier Spa. The following is the analysis of an imperial gallon of this water by Drs. Thomson and Loudon : —

			Grains.
Sulphate of Soda	..	-	323·19
Muriate of Soda	-	-	326·16
Muriate of Lime	-	-	164·49
Muriate of Magnesia	.	-	26·93
			<hr/> 840·77 <hr/>

			Cubic Inches.
Oxygen Gas	-	-	0·6
Azote	-	-	4·296
Carbonic Acid	..	-	16·830

The other springs possess the same constituents, though in variable proportions: some of them contain a small portion of iron, and some are slightly impregnated with sulphuretted hydrogen. Though somewhat more exciting than the Cheltenham springs, they may in general be considered applicable to the same kind of cases.

There are at Scarborough two saline springs, which are a good deal employed. They are termed the North and South Wells, and, according to Dr. Thompson, contain the following proportions of salts in a gallon of water. They likewise contain a certain portion of iron held in solution by carbonic acid gas.

	South Well.	North Well.
	Grains.	Grains.
Sulphate of Magnesia	- 22·41	105·94
Sulphate of Lime	- 147·12	47·64
Muriate of Soda -	- 25·36	7·23
Muriate of Lime	-	38
Muriate of Magnesia	- 3·88	
Carbonate of Lime	- 9·97	
	<hr/> 208·74 <hr/>	<hr/> 198·81 <hr/>

The South Well is most strongly impregnated with iron ; or rather, from its containing so small a proportion of aperient salt, the chalybeate property is more developed. The water of the North Well is laxative ; its aperient operation is, however, much weaker than that of the Cheltenham or Leamington water. The use of these springs is often combined with sea bathing.

# INDEX

TO THE

## MINERAL SPRINGS.

	Page		Page
Aix-la-Chapelle	- 34	Eaux-Bonnes	- 67
Aix-les-Bains	- 46	Eaux-Chaudes	- 69
Alexanderbad	- 207	Eger. <i>See</i> Franzensbrunn.	
Altwasser	- 202	Eilsen	- 107
		Ems	- 171
Baden (Austria)	- 42	Enghien	- 77
Baden-Baden	- 121		
Bagnères de Bigorre	64. 128	Fachingen	- 180
Bagnères de Luchon	- 65	Fideris	- 208
Baréges	- 51	Forges	- 110
Bath	- 222	Franzensbrunn	98. 156
Bilin	- 179		
Bocklet	- 104	Gastein	- 126
Borcette	- 40	Geilnau	- 201
Bourbon l'Archambant	- 141	Godesberg	- 209
Bourbon-Lancy	- 142		
Bourbonne-les-Bains	- 133	Hapsburg. <i>See</i> Schinznach.	
Brighton	- 222	Harrowgate	- 216. 220
Bruckenaue	- 106		
Busang	- 111	Kissingen	- 93. 212
Buxton	- 225		
		Leamington	- 228
Carlsbad	- 147	Leuk	- 136
Cauterets	- 58	Liebenstein	- 101
Chaudes-Aigues	- 192	Liebwerda	- 199
Cheltenham	- 227	Lucca	- 143
Clifton	- 226		
		Malmedy	- 89
Dinkhold	- 213	Marienbad	- 95. 152
Driburg	- 103	Matlock	- 226

232 INDEX TO THE MINERAL SPRINGS.

		Page			Page
Moffat	-	- 217	Schinznach	-	- 74
Mont d'Or	-	- 186	Schlangenbad	-	- 177
			Schwalbach	-	- 90
Nenndorf	-	- 78	Seidlitz	-	- 159
Néris	-	- 190	Selters	-	- 198
			Spa	-	- 86
Passy	-	- 111	St. Nectaire	-	- 189
Pfeffers	-	- 138	St. Sauveur	-	- 55
Plombières	-	- 140			
Pullna	-	- 162	Teplitz	-	- 166
Pymont	- 82. 158. 211		Tunbridge Wells	-	- 218
Reinerz	-	- 205	Vichy	-	- 182
Rippoldsau	-	- 109			
			Warmbrunn	-	- 71
Saidschütz	-	- 161	Weilbach	-	- 77
Salzbrunn	-	- 204	Wildbad	-	- 193
Scarborough	-	- 229	Wisbaden	-	- 115

THE END.

LONDON :  
Printed by A. SPOTTISWOODE,  
New-Street-Square.









